

Sea Grant International

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Executive Summary

In April 2002, NOAA Research's Office of International Activities (IA) submitted a proposal to the U.S. Department of State's (DOS) Oceans and International Environmental and Scientific Affairs Initiative (OESI) to assess the feasibility of adapting the Sea Grant model of linked applied research, extension and education to Latin America and the Wider Caribbean region. The overall goal was to determine whether or not university-based programs with these three features could serve as an appropriate institutional mechanism to address critical marine and coastal resource issues in a developing country context. The initiative was catalyzed as a result of expressions of interest from government and university officials in Honduras, Nicaragua, El Salvador and Ecuador to develop long-term Sea Grant-like programs. The University of Central America (UCA), Nicaragua; University of Zamorano, Honduras; the University of El Salvador; and the Escuela Superior Politecnica del Litoral (ESPOL) in Ecuador have all worked in cooperation with IA, the National Sea Grant College Program (NSGCP), the University of Rhode Island Sea Grant, and the Coastal Resources Center (CRC) to complete the goals of the OESI grant.

This document is the final report to the U. S. Department of State in fulfillment of the reporting requirements outlined in the Interagency Acquisition Agreement (IAA #S-OES-03-IAA-001). The report includes a series of documents and updates that resulted from hundreds of interviews, roundtable discussions, literature reviews, and small focus groups. The report also provides information related to our partnership development activities and capacity building exercises that included study tours and information exchanges.

As a result of the actions taken over the last two years, IA and CRC have concluded that the Sea Grant model could clearly fill a gap in coastal and marine resource management within the LAC region. However, this would require that NOAA and DOS make a high-level commitment toward Sea Grant International program development and work in collaboration with the U.S. Agency for International Development (USAID) to obtain the resources and development commitment necessary to make the proposed actions a reality. More importantly, Sea Grant program development in the LAC, and elsewhere, requires that participating universities, host-country governments, and regional and multilateral institutions make no less than a ten year commitment toward program development goals established by the multitude of local people, industries, conservation organizations, and others that are engaged with the coastal and marine environment on a daily basis.

IA, CRC, and the NSGCP have concluded that Sea Grant program development can provide a number of benefits for the marine and coastal communities of the LAC. As a result, the NSGCP and NOAA Research IA are committed to providing the necessary knowledge, skills, and abilities relevant to program development. We are also willing to provide our partner organizations with access to Sea Grant's 3,000 technical experts with experience in a wide variety of disciplines relevant to the LAC. This expertise lies within some of the following fields: fisheries management, community and economic

development, integrated coastal management, environmental education, aquaculture, training, marine research, and a whole host of others. Many U.S. Sea Grant Program Directors, technical specialists, and extension agents have expressed a commitment to share their experiences and knowledge to work toward LAC program development. Furthermore, each has expressed a strong desire to begin learning from their peers throughout the LAC region. Clearly, there is a lot of interest that exists within the U.S. Sea Grant network and within the LAC region to take the next steps toward the development of an independent LAC network that is linked to the U.S. network. If the necessary support can be garnered, this is an excellent opportunity to transfer one of NOAA's best and brightest programs internationally.

Section 1 of this report consists of two background papers and a concept proposal for a regional Sea Grant Network. The first background paper describes the structure and operating principles of NSGCP, summarizes NSGCP experience with international partnerships, and explores similar international program experience with linked education, research and extension. The second background paper explores options for establishing Sea Grant-like programs in two case study sites: Ecuador and the Gulf of Fonseca, shared by Honduras, Nicaragua and El Salvador. The concept paper draws from the background documents and a sequence of meetings at the two sites. It proposes the goals, operational principles and structure for a Sea Grant-like network in the LAC region.

Section 2 provides a historical view of this program through the presentation of periodic reports that were provided to the State Department as well as the wider Sea Grant network throughout the process.

Section 3 consists of the agendas, meeting notes and the lists of participants that participated in two regional roundtable workshops held in Ecuador and Honduras in October 2003. The roundtables engaged a variety of government, university and conservation organizations to disseminate information related to the Sea Grant model. The primary purpose of each roundtable was to discuss opportunities, problems and priorities for sustainable development and conservation of marine and coastal biodiversity, determine the desired outcomes that programs could achieve over the long-term and develop the basic principles and guidelines that should underlie the structure of Sea Grant international programs in the LAC.

Section 4 provides comprehensive lists of participants that were engaged in fact-finding visits conducted in January/February 2003 (Costa Rica, Guatemala, Nicaragua, El Salvador and Honduras), June/July 2003 (Costa Rica, Nicaragua, Honduras, and El Salvador), and July 2003 (Ecuador). More than 100 governmental and non-governmental actors as well as representatives of regional and international organizations were consulted during these visits.

Section 5 details the contribution of the Sea Grant Latin America and Caribbean program to the White Water to Blue Water Initiative. In March of 2004, the White Water to Blue Water conference in Miami brought together more than 650 Caribbean, Latin

American and U.S. representatives to: 1) learn about existing marine and coastal management efforts in the Wider Caribbean region, and 2) to strengthen or develop innovative partnerships. IA and its partners fully participated in this initiative and positive feedback was received from domestic and international partners following a Sea Grant International breakout session, a Sea Grant 101 training course and two informal roundtable discussions. Information on the Fulbright Senior Specialist-Sea Grant Partnership is also presented in this section.

Section 6 provides contact information for the NOAA Research Office of International Activities. NOAA Research's Office of International Activities is committed to developing beneficial partnerships with a wide range of governments, resource management agencies, universities, non-governmental organizations and private industries to ensure that the Sea Grant model is adapted and utilized in the most effective way to address coastal and marine resource issues. IA openly welcomes your feedback, comments and opinions regarding this initiative.

Sincerely,

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Section 1: Background Papers and Concept Proposal

Background Paper 1
Background Paper 2
Concept Proposal



**The Sea Grant Approach to Coastal and Marine
Research, Extension, and Education**
***A Review of International Experience and
Opportunities***

Background Paper No. 1

***Sea Grant International: Latin America and Caribbean
Initiative***



Final Draft

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Program

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ACRONYMS

ASGEPL	Assembly of Sea Grant Extension Program Leaders
CCOP	Coordinating Committee for Coastal and Offshore Geosciences Programs in East and Southeast Asia
CGIAR	Consultative Group on International Agricultural Research
ICLARM	International Center for Living Aquatic Resources Management
UHSGCP	University of Hawaii Sea Grant College program
KSGP	Korea Sea Grant Program
MMAF	Indonesian Ministry of Marine Affairs and Fisheries
MOMAF	South Korea the Ministry of Marine Affairs and Fisheries
NOAA	National Oceanic and Atmospheric Administration, U.S. Department of Commerce
NOAA/OAR	NOAA Office of Oceanic and Atmospheric Research
NSGCP	National Sea Grant College Program
NSGO	National Sea Grant Office
NSGRP	National Sea Grant Review Panel
OTIA	Office of Territorial and International Affairs, U.S. Department of Interior
PAP	Sea Grant Pacific Aquaculture Program
PIN	Sea Grant Pacific Island Network
PMC	Program Mission Committee
SGA	Sea Grant Association
SGIP	Sea Grant International Program
UCA	University of Central America, Nicaragua
UHSGCP	University of Hawaii Sea Grant College Program
UNAM	Universidad Nacional Autónoma de Mexico
USAID	United States Agency for International Development

1. INTRODUCTION

This paper describes the defining features of the U.S. Sea Grant College Program, summarizes the experience of Sea Grant with international partnerships, reviews applications of Sea Grant type programs in other countries, and explores other similar program experience with linked education, research and extension. This paper is part of a NOAA initiative to identify strategies for adapting the Sea Grant model to selected developing nations and to create a global network of institutions dedicated to discovering and applying the knowledge, values and technologies needed for more sustainable forms of coastal development and conservation.

The initiative is called the “Sea Grant Latin America and Caribbean Program” and is conducted under the guidance of the NOAA Research Office of International Activities, University of Rhode Island Coastal Resources Center, and University of Rhode Island Sea Grant program. This initiative is a response to requests from government and university officials in Honduras, Nicaragua, El Salvador and Ecuador to assess the feasibility of adapting the Sea Grant model programs in these countries. The funding for this initiative comes from the U.S. Department of State (Ocean, Environment and Science Initiative), NOAA Research Office of International Activities and the NOAA National Sea Grant Office.

This is one of two background papers, that together with a series of national workshops and expert meetings, are the basis for the development of a strategy for the implementation of a Sea Grant network in Latin America and the Caribbean.

2. THE SEA GRANT COLLEGE PROGRAM

The National Sea Grant College Program (NSGCP) was first proposed in the United States in 1963 as a means to “promote the relationship between academic, state, federal, and industrial institutions in fisheries”(Miloy, 1983) and three years later this idea was formalized by the National Sea Grant College and Program Act. Sea Grant's legislative charge is to "increase the understanding, assessment, development, utilization, and conservation of the nation's ocean and coastal resources by providing assistance to promote a strong education base, responsive research and training activities, and broad and prompt dissemination of knowledge and techniques" (PL94-461, Sec. 202(b)).

“When the 89th congress passed the National Sea Grant College and Program Act of 1966, it created the first federal program mandated to support activity across the full spectrum of the marine sciences. In the act, Congress set forth an approach involving research, education and outreach to promote the wise use of the nation's coastal, ocean, and Great Lakes resources for a sustainable economy and environment” (NSGO 1998).

The Sea Grant Program operates on a simple premise—apply the intellect of US universities and research institutions to the problems and opportunities associated with the use of marine resources. The Sea Grant Act called for an organization that is science-based, national in scope and committed to the transfer of scientific information to the public. In 1971 four universities achieved Sea Grant College status: Oregon State University, University of Rhode Island, Texas A&M University and University of Washington. Today, the Sea Grant network has approved programs in thirty one universities with over 300 affiliated universities

Sea Grant is a partnership of academia, government, and industry focusing on coastal and marine resources. It operates through a university-based network to meet environmental and economic needs. This partnership has created a national network of researchers and educators focused on promoting better understanding and more informed use of coastal and marine resources.

and several thousand researchers, educators, extension professionals and students.

The basic structure of a federal-state funding partnership is itself based on the time-tested paradigm of Land Grant Colleges—University-based research coupled with the transfer of science-based knowledge to communities and users through extension service. Establishing a formal structure to link and integrate university educators and scientists to extension agents provides a powerful means to transfer knowledge to advance wise coastal and marine development while promoting resource stewardship.

A Top-Down and Bottom-Up Network for Collaborative Problem Solving

The NSGCP was originally structured as a component of the National Science Foundation but in 1970 the program became part of the Department of Commerce, National Oceanic and Atmospheric Administration (NOAA). The NSGO provides base funding for Sea Grant and coordinates activities for the network of thirty state programs (see list of Sea Grant State College Programs, Annex 1). The national office in NOAA provides administrative and programmatic support in the form of developing national program initiatives, federal budget requests, program monitoring and evaluation, and communicating program activities to other NOAA and federal offices. The current administrative team of the national office consists of the Director, Executive Director with five associated staff, a Research Director with six associated staff, and the Outreach Director with four associated staff members.

The Sea Grant structure was designed to allow for significant autonomy at the state level. This autonomy has resulted in a diversity of organizational schemes, but some generalizations can be made. Most programs operate through a single university; a few programs are structured as university consortiums (Mississippi-Alabama Sea Grant Consortium and the South Carolina Sea Grant Consortium). Each program maintains an administrative office, which manages the research, extension, and communication activities and distributes funds on an annual or biannual basis to a wide range of institutions (i.e. not limited to only researchers at the host university) via a competitive grants process. Programs leverage state university resources as matching funds to those disbursed by the NSGO.

The Sea Grant program identifies topics of concern to the nation as a whole. State programs then tailor activities within the broad topics of concern that resonate in a given locale. Thus, the strategy of Sea Grant is to combine national-level and state-level priorities with the flexibility to adapt and respond to emerging, local resource needs. This strategic process between national and state levels builds knowledge for use by the network as a whole.

A collection of national associations, panels, assemblies, boards and committees has developed over the course of the program's history. Several of these are a formal part of the legislation and others have developed on an ad hoc basis as necessary. The National Sea Grant Review Panel (NSGRP) is part of the original legislative structure of the Sea Grant program. The fifteen appointed members of the panel set overall program policy, establish direction and conduct reviews of the National Sea Grant program.

The Sea Grant Association (SGA) is a non-profit organization comprised of a representative from each Sea Grant institution. SGA provides the mechanism for state and national programs to coordinate their activities, to set priorities at both the regional and national level, and to provide a unified voice for these institutions on issues of importance to oceans and coasts. The SGA has a number of standing committees

Sea Grant activities exist at the nexus of local, state, national and sometimes international interests. In this way, local needs receive national attention, and a national commitment is fulfilled at the local level.

including the Program Mission Committee; External Relations Committee; and Finance Committee. The Program Mission Committee is charged with strategic planning and preparation of policies and procedures to accomplish the Sea Grant mission. Sea Grant identifies national priorities by regularly sorting through the network's priorities, accomplishments, and best practices.

The focus of individual Sea Grant College Programs must be both consistent with the overall vision and direction of the NOAA National Sea Grant Program, and be tuned to the environmental, social and economic priorities and problems at the state level. State programs are designed to respond in a timely-fashion to locally identified education, research and extension needs. This top-down and bottom-up approach, built into the organizational and governance structure of Sea Grant, provides the inherent flexibility to ensure that both focused long-term strategies for impacting national-level marine and coastal priority issues are addressed, while at the same time allowing each program the ability to tackle important local issues.

Most state programs have Advisory Boards or Councils, which provide programmatic direction. They are composed of a wide variety of stakeholders and play a pivotal role in identifying priority coastal and marine issues and actions that the Sea Grant programs can take to address those issues.

Cross cutting "theme teams" have been formed to coordinate activities on selected issues of national importance and disseminate information. The system of theme teams pulls together the intellectual and pragmatic resources from throughout the national network, develops products, catalyzes sharing of information and ideas, and acts as a well-informed voice for responsible stewardship of coastal ecosystems in specific topics of concern.

Thematic areas are defined by the SGA, but ideas for themes can be brought forth to the SGA's Program Mission Committee by anyone within the Sea Grant network. Currently, theme team topics are 1) aquaculture, 2) biotechnology, 3) coastal communities and economies, 4) natural hazards, 5) ecosystems and habitats, 6) marine and aquatic science literacy, 7) fisheries, 8) digital ocean, 9) urban coast, and 10) seafood science and technology.

The Assembly of Sea Grant Extension Program Leaders (ASGEPL) facilitates communication and interaction among the Sea Grant Extension programs and with others outside the Sea Grant network. This Assembly improves the delivery of science-based information to constituent groups at the local, regional and national levels. The ASGEPL is comprised of an extension representative from each state Sea Grant program. Similar organizations exist for Sea Grant Communicators, Educators, and Fiscal Officers. Regional efforts to coordinate research and extension work are also supported through the existence of five regional groups of state programs: the Great Lakes, Northeast, Mid-Atlantic, Southeast Atlantic/Gulf of Mexico and Pacific.

Example of State Sea Grant Advisory Council

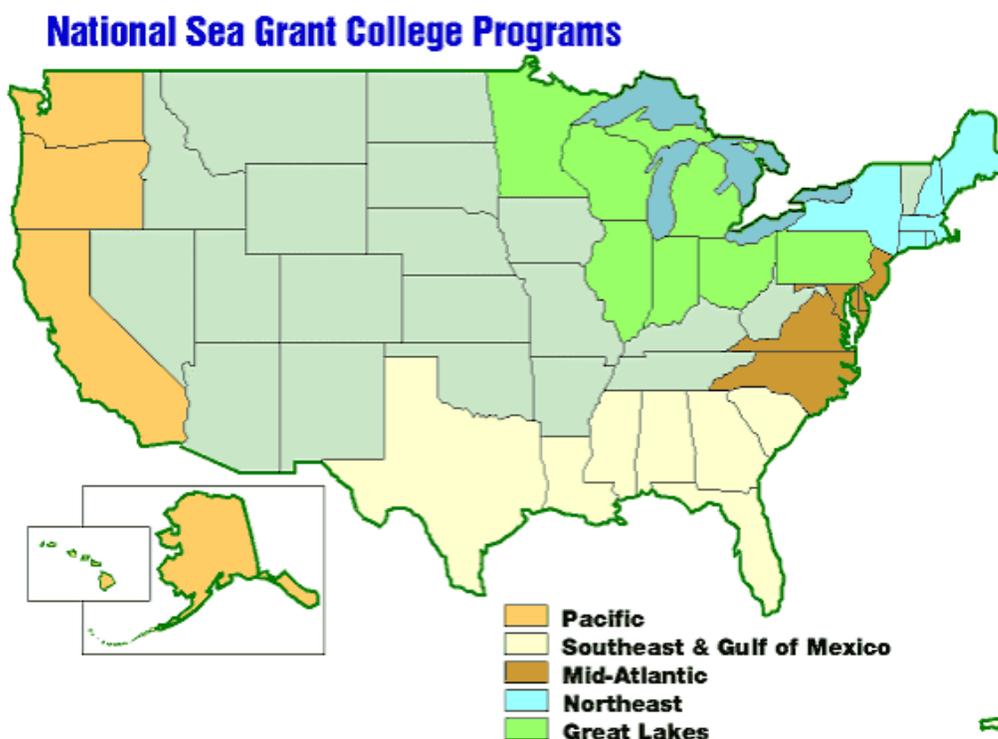
The Louisiana Sea Grant Advisory Council meets twice annually to review selected Sea Grant activities and provide counsel regarding program focus, development, and operations. This Advisory Council has eighteen members representing a diversity of stakeholders ranging from the Louisiana departments of Natural Resources, Environmental Quality, Wildlife and Fisheries, and Recreation and Tourism. There are also representatives from the private sector such as Tidewater, Inc., the Slater-Midboe Law Group, Nunez Insurance Agency, and the Consortium for Plant Biotechnology to name just a few.

Stages of Program Development

All programs have achieved their designation as a Sea Grant College Program by moving through a series of four development steps: 1) Project Grant, 2) Coherent Area Program, 3) Institutional Program, and 4) Sea Grant College. Programs progress by demonstrating success, developing the necessary organizational capacity and working with the NSGO to ensure transparency and accountability in their activities. The four-tiered process of development allows programs to develop state and local partnerships, gradually define the scope of their work, and gain familiarity with the Sea Grant operational structure and system.

In the first step, an institution applies to the National Sea Grant Office (NSGO) for a Project Grant that is in the form of a proposal to initiate a Sea Grant programmatic activity for a given time period. After the institution has demonstrated capacity and competence in program activities it is eligible to apply to the NSGO to become a Coherent Area Program, which allows the institution to conduct Sea Grant activities in a limited geographic area or field. Federal grants can be made to Coherent Area Programs on a continuing basis if the quality and relevance of the program is maintained. After an institution has shown competence as a Coherent Area Program they may apply to the NSGO to gain status as an Institutional Program. The fourth and final step in program development occurs when an Institutional Program applies for status as a Sea Grant College. This designation is made by the U.S. Secretary of Commerce. The institution then has the broad responsibility for administering a state Sea Grant program and the mandate to engage all of the institutions of higher learning in the state.

In some cases special programs have been developed to address shared regional issues. The most recent of these, the Lake Champlain Sea Grant Outreach Program, is a joint effort of the New York and Vermont Sea Grant programs. The purpose of the Lake Champlain Sea Grant Program is to provide scientific information to serve as the basis for wise development and conservation of the Lake Champlain ecosystem.



Funding and Competitive Grant Procedures

The National Sea Grant Office managed funds totaling \$112.3 million in 2001 with approximately 55% of the funds from federal appropriations and matching funds from state partners accounting for about 33% of the total. Since 1997, federal funding for state programs has been based on a combination of base funding, merit funds, program development awards, pass-through funding, national infrastructure support grants (rapid response grants) and unobligated funds. In Fiscal Year 2001, the breakdown for the use of federal Sea Grant funds was Research (66.3%), Outreach (29.7%), Education (4.8%) and Administration (8.7%) (NSGO 2002).

A minimum Federal investment to operate an effective Sea Grant Program has been determined to be approximately \$1.8 million (\$1.2 million Federal funding and \$0.6 million State funding). This allows for approximately nine modest sized research projects per year, four to five extension specialists and a budget for management, education and communications. Some programs have yet to reach the minimum \$1.2 federal base funding level and therefore are eligible to receive "base-minimum adjustments" when the funds are available from the NSGO. These supplementary funds are awarded based on merit grades from performance evaluations. (Sea Grant Association, 2002)

State Sea Grant programs are expected to provide a 2:1 match for federal funds but many programs actually leverage at a higher rate.

"This highly leveraged investment in Sea Grant is crucial to ensure appropriate federal, state, local, university, and private-sector efforts to support and enhance our burgeoning coastal economy while conserving and protecting the natural resource base upon which it depends" (SGA Position Statement 2/5/02).

Most programs operate on a biennial research schedule with approved projects on a two-year time frame. Requests for Proposals (RFP) are disseminated widely and proposals are accepted from a variety of institutions, not limited solely to researchers from the host university. For example, the Connecticut Sea Grant program in the 2000-2001 funding cycle awarded grants not only to the University of Connecticut (the Sea Grant host university) but also to the Maritime Aquarium, Wesleyan University and Yale.

All Sea Grant related activities of applied research, extension and education are subject to a rigorous scientific peer-review process (similar to the review process of the National Science Foundation). Each state Sea Grant program solicits pre-proposals and full proposals for research within its geographic boundaries in interest areas guided by a five-year Strategic Plan and a two-year Implementation Plan. Short pre-proposals are solicited first by the state Sea Grant program. Pre-proposals are then reviewed extensively by national experts located outside of the state. This panel balances the strategic Plan of the Sea Grant program with the research ideas proposed, and makes recommendations on which pre-proposals should be invited to prepare and submit full proposals.

After full proposals are received, they are reviewed by three to five experts outside the local program selected by the state Sea Grant program. Each state program's management team then convenes a Technical Review Panel selected from national experts outside of its geographic boundaries to discuss review findings, deliberate on each proposal, rank proposals, and decide on funding for selected proposals. Research and extension proposals approved at the state-level are then sent to the National Sea Grant Office for final approval.

Sea Grant program performance evaluations are conducted every four years by senior internal and external evaluators to determine impacts and quality standards.

Research, Education, and Extension Linkages

Sea Grant is different from most other US federal programs because of its three-pronged approach of applied research, education and extension (there are exceptions, e.g. systems of education, experimentation, and cooperative extension of the U.S. Department of Agriculture). The linkage between applied research, extension and education is a fundamental attribute of the Sea Grant Program. It ensures that the results of research are disseminated back to the stakeholders in a timely manner and conversely ensures that social and natural scientists are kept abreast of evolving coastal and marine resource issues.

The communications team at each Sea Grant Program provides the means to disseminate information from research and extension projects in a timely and effective manner through a variety of outlets: press releases, bulletins, reports, newsletters, radio and television programs and websites.

The Sea Grant Extension component is typically a university-based educational program that applies knowledge and understanding gained through research to aid individuals and groups. The goal of extension is to effect change by having individuals, groups or institutions use science-based information.

Much of Sea Grant's strength lies with its local, grass roots approach. Overlaid on this local approach is a strong regional and national network. The experience and lessons from extension work in one community can, for example, be easily shared and modified for use in another community on the other side of the continent.

Some programs have a specific requirement in their research RFP's that require the Principle Investigator to integrate some type of extension into proposed project activities. Other programs ensure this link between extension and research by assigning an extension agent to research grants to assist with design and implementation of extension activities. In some cases, Sea Grant programs subcontract the extension component to a partner university or state agency.

Approximately two-thirds of the Sea Grant Extension service have formal affiliations with the State Cooperative Extension Service (CES). Partnering with CES builds a broader fiscal and human resource base for Sea Grant Programs.

Strengths and Reasons for Success

The National Sea Grant College Program has evolved over the past thirty-five years into a functional network of programs providing science-based answers to coastal and marine problems. Sea Grant programs have promoted sustainable economic development, created new technologies, products and services, enhanced coastal and marine resource management, reduced the loss of life and property, and educated tens of thousands of students. Some of the key characteristics that are the reasons for Sea Grant's success include:

Addressing the Urgent Needs of Society. Sea Grant is a strategic program, developing medium and long-term goals and priorities for research, education and extension in close collaboration with coastal stakeholders. In this way, resources are channeled to the most pressing social, economic, and environmental issues.

Continuity and Long Term Investments. Once a university has met Sea Grant selection standards and has been formally designated as a member of the network, there is a federal commitment to sustain long-term financial support . Long-term commitment builds a community of coastal managers, policy experts, educators, researchers and private sector partners dedicated to resolving the issues of coastal and marine development and conservation. This permanence is also what makes long term strategic planning possible.

Trust. Continuity and local partnerships also build trust with stakeholder groups and a supportive constituency that are critical for success of extension work. Sea Grant as an institution has a reputation of being a committed and dynamic group of researchers, educators, communicators and extension agents that produce respected and practical scientific knowledge for society. Sea Grant also adopts a non-advocacy role and is viewed as an impartial and objective broker of information.

Catalyzing Existing Institutional Capacities. Sea Grant serves as the catalyst for bringing intellectual and physical resources to bear on the needs and opportunities of communities. Rather than create new institutions, Sea Grant mobilizes and sustains long-term connections with existing institutions to tackle coastal and marine challenges. Utilization of largely existing people and facilities minimizes duplication of effort, leverages resources, and creates assets of considerable pragmatic value at a comparatively low cost to the taxpayer. Maintaining institutional connectivity is important and having an institutional coordinating point (Sea Grant) assists in accomplishing this task.

Striving for Excellence and Accountability. Sea Grant programs operate under a formal system of checks and balances with rules that allocate responsibility among a central office, participating universities, and individual researchers and extension agents. The system relies on strategic planning, competition, and a rigorous peer review process. Funding is reduced or withdrawn from programs and individuals that do not meet standards of professional excellence in management, education, research and extension. A defining feature of Sea Grant is that excellence is judged primarily against the relevance of the activity to priority coastal and marine issues.

Local Ownership. Sea Grant is designed as a decentralized system that responds to the priority issues posed by coastal conservation and development in a given place. Strategic plans, implementation plans, annual reporting, and external program assessments involving all coastal stakeholders are required of each local program. While the network as a whole identifies common topics of concern, the formulation of the agenda of an individual participating institution, and the process for designing and selecting those who will participate in a given program, resides primarily with that institution. Thus, the ownership of each program is local.

A Nested System. The Sea Grant network as it exists today in the United States functions as a nested national system that operates to address ten priority “themes”. Thematic focus areas gather the intellectual resources from throughout the national network, sharing information and ideas, and acting as a well-informed voice for responsible stewardship of coastal ecosystems at the local, state and national scale.

3. THE BENEFITS OF AN INTERNATIONAL SEA GRANT NETWORK

Most coastal regions of tropical developing nations are characterized by high and growing population density, increasing human pressures on natural resources and ecosystems, resource use conflicts, and growing vulnerability to natural disasters. The percentage of the global population that is defined as coastal is now about 50%, and it is increasing. Of the world's fifteen largest cities, all but two are located on a coast. In Latin America, nearly 70% of the region's population now lives in cities, and 60 of the region's largest 77 cities are coastal (Hinrichsen, 1998). Such population and associated economic growth have produced large environmental impacts on the marine and adjacent land ecosystems.

As stewards of the Earth's coastal zone, our own efforts are undermined with widespread habitat loss, pollution of coastal marine ecosystems, over-harvesting and destructive fishing. One-third of the world's coastlines face serious environmental degradation. Half of the world's wetlands were destroyed in the 20th century, and nearly 60% of the earth's coral reefs are now threatened by pollution and other dangers. The global oceanic fishing fleet is today 40% percent larger than what the oceans can sustain. As testimony to this fact, 35 percent of 200 major fish stocks are currently classified as overfished or at their biological limit (Costanza, et al., 2000). These fish stocks currently account for 77 percent of world marine landings.

The underlying sources of coastal and marine environmental degradation are deep rooted. All developing countries are confronted with well known, acute socio-economic problems related to poverty and poor governance. Governments are poorly funded and often overwhelmed with the burden of poverty alleviation and maintaining basic infrastructure. Conservation efforts often fail owing to lack of financial, political and sometimes popular support.

Nevertheless, economic development must be built on a foundation of sustainable resource use and environmental protection. In the Latin America and Caribbean region many of the economic opportunities depend on its natural resource base, including tourism, fisheries, aquaculture, agriculture, and forestry products. Improving the management and conservation of critical watersheds and coastal habitats provides a mechanism to integrate natural resource conservation with the development of sustainable economic opportunities.

As governments, communities and society explore ways to solve worsening problems of loss of the natural stock of living marine resources, inappropriate coastal development, invasive species and pollution, many have looked to the example of the National Sea Grant College Program as a way forward. The benefits of an international Sea Grant network include:

Benefits to Sea Grant and Foreign Partners. Expanding the domestic Sea Grant network to a global system with associated international partnerships and collaboration will energize the Sea Grant Program and create two-way benefits. One of the benefits would be learning, knowledge and hands-on experience in how to tackle problems of habitat destruction, overfishing, coral reef conservation, coastal erosion, mitigation of coastal hazards and resolving conflicts between competing user groups. These are global priority issues along all coastlines.

For participating U.S. Sea Grant programs, an international dimension will provide "platforms" where research, curricula and the development of best management practices can be adapted to new social and environmental contexts. Established international programs would provide in-country facilities and logistical support for visiting research scientists and student research teams. In-country program contacts can also help to expedite scientific research permitting process that often can be confusing and time consuming for foreign investigators.

Benefits to Other Organizations and Initiatives. Major investments have been made in coastal and marine conservation and sustainable use but communication and knowledge sharing has been *ad hoc* and inefficient. Too often coastal management efforts have been conducted in isolation from other efforts. The result is a smaller cumulative impact of the total investment in resource management.

Sea Grant can provide a mechanism to re-integrate the many approaches to coastal and marine science and extension. In the U.S., Sea Grant programs provide a clearinghouse for information, contacts and work on coastal and marine development and conservation. By contrast, in most developing nations, institutions with continuity and publicly accessible resources on coastal issues of societal concern are usually absent. As a consequence, there is a constant reinventing of the wheel as new projects come and go. Sea Grant programs would help fill this void, thereby increasing the effectiveness and efficiency of otherwise isolated coastal and marine initiatives. The Sea Grant structure could also act as a central coordinating forum, collectively setting strategic priorities in coastal research and extension with stakeholder groups and increasing the cumulative benefits of the work of existing organizations.

A global Sea Grant network would compliment and provide new opportunities for many United States Government programs such as the GLOBE program, the Fulbright Senior Specialist Fellowship program and projects funded under many other federal agencies such as those of the USDA Cooperative State Research Extension and Education Service (CSREES) and USAID. GLOBE is a worldwide hands-on, primary and secondary school-based education and science program. The traditional Fulbright Fellowship program allows graduate students from the United States to research or study in foreign countries while the Senior Specialist Fulbright provides opportunities for career professionals to take part in short-term (three to six weeks) assignments that have been specifically requested by a foreign institution.

Sea Grant institutions established in coastal nations around the world would also provide benefits for other bilateral and multilateral programs (e.g. United Nations, World Bank, Inter-American Development Bank, etc.) and would add a new element of support for implementation of international and regional commitments.

Unique benefits that Sea Grant programs can provide include scientific knowledge, strengthening of local institutions, consultative identification of local issues and needs, local ownership of strategic priorities, trust, convening power, and supportive constituencies.

National Benefits. Sea Grant programs would contribute to the management of coastal and marine resources in an integrative manner that combines

White Water to Blue Water Initiative

A “White Water to Blue Water” initiative for the Wider Caribbean Region was announced by the U.S. State Department at the World Summit on Sustainable Development in Johannesburg, South Africa in September 2002. The Wider Caribbean Region encompasses twenty-six countries and island states.

The goal is to strengthen both national and regional institutional capacity to implement cross-sectoral watershed and marine ecosystem management. The White Water to Blue Water initiative is intended to identify ways to improve implementation of regional and international commitments and to increase partnerships and the cumulative impacts of efforts in coastal and marine sustainable development.

Steering Committee deliberations have clearly highlighted the need for national institutions in the Wider Caribbean with the characteristics and strengths of the Sea Grant model. Like the U.S. Sea Grant program, common priority themes and theme teams have been developed.

conservation with the creation of economic opportunities. Sea Grant programs build the long-term capacity base needed within an institution to address the development and conservation needs of the coastal zone by supporting research, developing marine and coastal curriculums and supporting the interests of undergraduate and graduate level students. The characteristics of Sea Grant that make it effective in the United States would also apply to other countries—especially institutional capacity building, flexibility to meet local needs, transparency, strategic planning, science linked with extension, and partnerships that increase local capacity to manage resources. Knowledge is vital in the conservation efforts now unfolding to preserve marine ecosystems. Extension of knowledge to users is an area of particular need in most developing nations. Most low-income countries have not been successful in dedicating the resources to a strong, public-sector extension program with links to educational institutions.

In the United States, Sea Grant has been an engine for economic growth and cost savings through the development of new products, innovations, and technologies in aquaculture, marine biotechnology, fisheries, seafood processing, and the marina and boating industry. Research and extension to reduce the risks of natural disasters in coastal regions have saved lives and saved society hundreds of millions of dollars in avoided property damages. Education efforts have greatly enhanced the general public's awareness of the marine sciences and knowledge about the coastal and marine environment. Successful Sea Grant programs in other countries would bring similar social, educational and economic benefits.

Regional Benefits. Regional and global networks of programs modeled after Sea Grant would provide a much needed forum to share resources, knowledge and experience, organize initiatives, leverage resources and provide a focal point for information management. This would in turn allow for more effective and efficient resolution of shared marine and coastal resource management issues. The network structure of the NSGCP provides what has proven with experience to be an effective approach for promoting regional cooperation, technology transfer and capacity building. It facilitates functioning connections between programs allowing different regions to share ideas, exchange technical expertise, promote cooperation, and prioritize thematic areas of focus.

A problem that has not yet been solved in the management of living marine resources is one of over exploitation of important pelagic coastal resources simultaneously in two or three countries. For example, Ecuador and Peru fish the same fishery stocks but do not share common management policies that promote the objectives of sustainable exploitation. Similarly, Honduras, El Salvador and Nicaragua share the resources of the Gulf of Fonseca, but each country has its own fishery, conservation and management schemes. National Sea Grant institutions functioning in areas where several countries share coastal and marine resources would provide a mechanism for promoting harmonization of coastal and marine conservation efforts. Greater coordination and harmonization of independent management approaches would reduce costs and improve effectiveness. An impartial interaction between universities can also help transcend long standing political impasses between countries that share marine resources.

4. PAST EXPERIENCE WITH SEA GRANT OVERSEAS

The Sea Grant program has a long history of international cooperation and assistance. From the inception of the idea in the mid-1960's to the present, there have been varying levels of commitment to international collaborative activities and programs. Initiation of the Law of the Sea Convention in the early 1970's provoked concerns regarding international research access and data rights. This provided the impetus for the Sea Grant program in 1976 to adopt

legislation for an international component to its mandate—the Technical Cooperation Assistance Program (under Section 3 of the Sea Grant Program Act of 1976). This program was redefined by Congress two years later as the Sea Grant International Program (SGIP). The goals of the Sea Grant International Program were to:

- Enhance cooperative international research and educational activities with universities on ocean and coastal resources
- Encourage technology transfer that enhances wise use of ocean and coastal resources in other countries
- Promote the international exchange of information and data on the assessment, development, utilization and conservation of ocean and coastal resources
- Support other U.S. international initiatives whose purposes are related to research, education, technology transfer and public service concerning the understanding and wise use of ocean and coastal resources

SGIP projects facilitated educational, research and technical exchanges with universities and marine research institutions in other countries. The International Program was federally funded from 1978 to 1983 and involved 12 projects in 19 countries with a total budget of \$3 million. Projects primarily focused on education, research or technical partnerships rather than on capacity development of partner universities to establish their own Sea Grant type programs.

Federal funding for SGIP was discontinued in 1983. However, the Sea Grant International Program was not removed from federal legislation until the Marine Resources Revitalization Act of 1997 repealed Section 3 of the Sea Grant Program Act of 1976. From 1983 onwards, limited international research and collaboration have continued through a number of decentralized state programs without the funding support of the National Sea Grant office. There have also been a number of Sea Grant program and other U.S. federal agency partnerships with governments and universities in other countries, such as Korea, Indonesia, Nicaragua, and Honduras, with the purpose of long term institutional capacity development for Sea Grant type research, education and extension.

The Sea Grant International Program (1978-1983)

This section provides a summary of Sea Grant International Program projects that were funded by the federal government until 1983 (Ebitz and Murray, 1984). A characteristic of most of the projects funded under SGIP was complementary partner support, often equivalent in value to the SGIP budget. Partner organizations contributed in the form of salary support, local travel, housing, field logistics, publication of conference proceedings and research, use of research vessels, freight charges, use of offices, and computer time. Thus, although the SGIP operated with a total budget of only \$3 million, the impact was much greater.

1. ***University of Hawaii Sea Grant International Cooperative Program in the Pacific.*** From 1979-1982 the University of Hawaii Sea Grant College Program (UHSGCP) partnered with the University of the South Pacific and the University of Guam to bring the benefits of Sea Grant led marine education, research, and extension to Pacific island groups in Micronesia and Polynesia. This program focused on “training of islanders.” A number of these trainees are still active leaders in marine enterprise and affairs of the south Pacific Islands. Guam received both research and extension funding. Extension agents were also supported through SGIF in American Samoa and the Commonwealth of the Northern Marianas. The initiative was funded with a \$288,500 grant from the SGIP.

2. **University of Miami Training and Information Exchange with Colombia.** The University of Miami worked with several Colombian partners in a three-year, \$311,400 project. Partners included the Colombian Oceanographic Commission, the Institute for the Development of Renewable Natural Resources, the Hydrographic and Oceanographic Research Center, the University of Bogotá, the University of Cartagena, the University of the Andes, and the National University of Colombia. The objective was to enhance the capability of Colombian scientist to provide useful scientific information for the development of management plans for coastal and marine resource management. Activities involved a series of lectures on integrated marine and environmental research of Cartagena bay and job training in the design, planning, execution and coordination of field and laboratory programs.
3. **Maryland Sea Grant Partnership with the Department of Microbiology, Institute of Public Health, Egypt.** A two-year project between the Maryland Sea Grant Program and the Egyptian High Institute of Public Health was initiated in 1979 with a SGIP budget of \$134,400. The objective was to enhance Egyptian capabilities in marine environmental microbiology. Activities included workshops, student training, application of field techniques, and an annual seminar on environmental microbiology in tropical waters.
4. **LSU Sea Grant Partnership with the National University of Mexico.** A four year project between the Center for Marine Science at Louisiana State University and Universidad Nacional Autónoma de Mexico (UNAM) had the goal of improving Mexican capabilities for ecosystem analysis and coastal management. The project was funded with an \$111,200 SGIP grant and included support for participation in scientific meetings and conferences, information exchange, graduate student training, and joint research and publication. The project involved a cooperative study of management topics associated with the shrimp fishery of Laguna de Terminos and the development of a hydrodynamic model. An evaluation of the project found that the project significantly enhanced marine science capability at UNAM and scientific collaboration exchange between the two partners.
5. **University of Delaware Partnership with the University of Costa Rica.** The University of Delaware's College of Marine Studies (CMS) worked with the University of Costa Rica (UCR) from 1979 to 1983 with a SGIP grant of \$623,500. The project had several components including training, technology exchange, equipment and vessel exchange, and research. The University of Delaware stationed a scientific research vessel in the Gulf of Nicoya for four years with both research and crew staff from the University of Delaware and the University of Costa Rica. The first outcome was an ecological assessment of finfish and benthic invertebrates, which was followed by a water quality assessment. Several graduate students from CMS and the UCR conducted research associated with this project for their masters' degree. The Sea Grant director of the University of Delaware, Dr. Thoroughood, indicated that the formal and informal educational exchange that occurred between the two universities was one of the principal benefits of the program.
6. **VIMS and USC Partnership with the Israel National Oceanographic Institute.** The Virginia Institute of Marine Science and the University of South Carolina conducted a two year project with the Israel National Oceanographic Institute (INOI). The objective was to strengthen marine research capabilities of both partners. The project was funded with a \$148,000 SGIP grant and in-kind contributions totaling approximately \$100,000 from INOI. Other supporting institutions from Israel included the Israel Port Authority, Ben Gurion University, and the Coastal and Marine Engineering Institute of Technion University. This

project was also linked to an Israel and Egypt USAID program involving the Scripps Office of Naval Research.

- 7. *New York Sea Grant Institute Partnership with the University of Concepción, Chile.*** The New York Sea Grant Institute was involved in a three year, \$72,000 project with the University of Concepción (UC) to strengthen its marine science program. A formal Memorandum of Understanding was signed by the presidents of both universities. The project supported graduate students in marine sciences, research on the Bay of Concepción, and short courses in marine instrumentation.
- 8. *University of Florida Partnership with the Indian Institute of Technology, Bombay.*** The University of Florida partnered with the Indian Institute of Technology in Bombay (now Mumbai) to produce a course for middle-level engineers concerned with implementing their country's master plan for improving small and intermediate-sized ports. This one-year project had a SGIP budget of \$19,300 and counterpart financial contributions to conduct the course. The course brought together harbor engineers, consulting firms, universities and government ministries and facilitated an exchange of technical information. It had the effect of increasing the government's support for postgraduate courses for public employees. The partnership between the University of Florida and the Indian Institute of Technology also catalyzed the establishment of links between other universities, including the University of California, Berkeley; University of Trondheim, Norway; Norwegian Institute of Technology; and, School of Engineering at the Aristotelian University of Thessaloniki, Greece.
- 9. *Lehigh University Partnership with the Indian Institute of Technology, Kanpur.*** Lehigh University worked with the Indian Institute of Technology in Kanpur to educate graduate level students in geotechnical ocean engineering. The two year project had a SGIP budget of \$175,000 and was intended to support graduate level research and education, establish a marine geotechnical data bank in India, develop specialized ocean engineering short courses and provide Indian faculty and students with the opportunity to study in the United States. The project was discontinued in its early stages when the project's principal investigator left Lehigh University.
- 10. *Oregon State University Partnership with Universities in Chile and Mexico.*** Beginning in 1978, Oregon State University (OSU) worked closely with the Catholic University of Valparaiso and several other Chilean and Mexican universities during the course of four years. SGIP provided \$492,500 and Chilean partners provided an equivalent contribution, demonstrating commitment and an equal partnership relationship. The objective of the project was to build competence in marine resource conservation and development, and to increase international exchange of marine information and data. This project was built from the experience of a decade of OSU cooperative marine programs in Latin America. The project organized two major conferences on marine science and technology, developed mechanisms for sharing of data and scientific results between U.S. and international researchers, provided opportunities for marine extension in Chile, supported graduate studies, and developed curriculum in marine resource management and ocean engineering.
- 11. *University of California Partnership with Universities in Mexico.*** The University of California (UC) was involved in a project with Mexican institutions and universities with the goal of improving research and education capabilities in the marine sciences in Mexico. Partners in the \$240,000 project included: Instituto Nacional de Pesca; Escuela Superior de Ciencias Marinas in Ensenada; Universidad Autónoma de Baja California; Centro de Investigaciones y de Educación Superior de Ensenada; and, Centro de Investigaciones

Biológicas, La Paz. The project built upon preexisting working relationships among marine scientists at UC, San Diego State University, the National Marine Fisheries Service Southwest Fisheries Center and a number of Mexican institutions.

The project supported sixteen cruises on U.S. and Mexican research vessels, establishment of a joint mussel-watch program, sharing of data and technical fishery methods, completion of over 120 short courses, and development of marine libraries. The program was able to leverage \$819,000 in research funding and \$250,000 in development assistance funding. Program evaluation found that the success of the project was based on its truly cooperative nature.

- 12. URI Sea Grant Partnership with Universities in Malaysia.** Faculty at the University of Rhode Island and several universities in Malaysia—Universiti Malaya, Universiti Pertanian Malaysia, and Universiti Sains Malaysia—collaborated in a four-year project designed to strengthen Malaysian capabilities to address and solve marine resource problems. The SGIP provided \$379,000 and Malaysian contributions were estimated at over \$100,000, including the support of the National Fisheries Development Company of Malaysia for selected research projects. The project focused on three areas: 1) economics of artisanal fisheries, 2) population dynamics and management of marine fisheries and, 3) coastal ecosystem studies in relation to fish production. URI faculty were involved in programs at Malaysian partner universities and helped develop research, education and marine advisory services. Several faculty members from Malaysia earned higher degrees at URI during the course of the project.

Sea Grant International Collaboration (1984-Present)

This section provides a summary of international collaboration and research following the end of funding of SGIP.

- 1. Latin America and Caribbean Sea Grant Initiative.** The NOAA National Sea Grant Office, NOAA/OAR International Activities Office, the University of Rhode Island Coastal Resources Center and the University of Rhode Island Sea Grant program began working together in 2003 to develop options for establishing a network of Sea Grant programs in Latin America and the Caribbean. This work is made possible by grants totally \$180,000 provided by the U.S. State Department (Ocean, Environment and Science Initiative) and the NOAA National Sea Grant Office. The initiative is a response to requests for assistance from government and university officials in Honduras, El Salvador, Nicaragua and Ecuador to build Sea Grant programs in these countries. Activities include in-country consultations, national workshops, background papers, expert meetings, and development of a strategy for a LAC Sea Grant program. National workshops in Ecuador and Central America were held in October 2003. The background papers and strategy paper are planned for completion by early 2004.
- 2. Sea Grant Disaster Relief Projects in Honduras and Nicaragua.** In October 1998, Hurricane Mitch stalled and dumped a year's rain on Central America in forty-eight hours. It was the largest hurricane to hit Central America in two hundred years. Flash floods and mudslides wreaked devastation on a vast scale. Honduras, the second-poorest nation in the Western Hemisphere, was the hardest hit. In a population of 6 million, almost 6,000 people were killed and 1 million made homeless. Seventy percent of the country's productive infrastructure was damaged or destroyed. The government's initial estimate of the cost of reconstruction was \$5 billion.

The U.S. Government assisted with disaster aid, the majority of which was distributed through the United States Agency for International Development (USAID). Sea Grant approaches and partnerships were part of the package of U.S. disaster assistance to Honduras and Nicaragua. NOAA, USAID, the United States Geological Survey, the United States Department of Agriculture, and other agencies collaborated in the development of reconstruction and disaster mitigation projects that involved Sea Grant College programs at the University of Michigan, University of Florida and the University of Puerto Rico.

Both Nicaragua and Honduras realized major destruction of the shrimp aquaculture industry following the hurricane. In both countries, farmed shrimp is one of the top sources of export earnings, employment and income in both countries. As a result of the hurricane, both Nicaragua and Honduras suffered damages estimated at \$81.6 million. Central American cultured shrimp exports totaled \$148 million in 1998. USAID and USDA funded projects through U.S. Sea Grant programs to assist small-scale shrimp aquaculture farmers in areas of aquaculture technology, development, and extension.

The first of these projects was a marine extension project in the Gulf of Fonseca region of Honduras and Nicaragua focused on shrimp farming under the leadership of the University of Puerto Rico Sea Grant Program (UPRSGCP). The goal was to develop an information and technology transfer program to educate and change the attitudes, perceptions and practices of resource users, resource managers and the general public with relation to the sustainable use of coastal and marine resources. The University of Central America (UCA) in Nicaragua and Zamorano University in Honduras were implementing project partners. A project Director and three marine extension agents were hired from each University. This program was funded from 2001 to 2002 with a budget of approximately \$890,000.

The second activity implemented in cooperation with the National Sea Grant Office was the Nicaragua Small Shrimp Producer Assistance Program lead by the Michigan and Florida Sea Grant programs. The goal was to modernize Nicaraguan shrimp farm technologies to enhance production efficiency, economic viability, and reduce the spread of viruses. The program was composed of three interrelated components: 1) construction of a demonstration, closed intensive shrimp production system, 2) improvement in aquaculture financial systems, and 3) enhancement of aquaculture competence within small and medium sized operations.

The first component provided a demonstration of the feasibility of a closed intensive shrimp production system. One of the benefits of a closed system is reduced risk of the introduction of virus. The second component was targeted at increased availability of commercial financial credit and development agency resources for investments in closed shrimp production systems. The final component provided education and training to the aquaculture industry.

Following completion of these projects, University of Central America in Nicaragua and the University of Zamorano in Honduras, both of which were involved with the hurricane disaster projects, expressed to NOAA following completion of these projects that they were interested in continued assistance to help develop locally managed programs based on the Sea Grant model.

- 3. University of Connecticut Sea Grant Program Partnership with Mexico.** The University of Connecticut Sea Grant program hosted a delegation of ministers and government officials

from Baja California, Mexico in February of 2003 for the purpose of discussing the establishment of a Sea Grant type program located at the Universidad Autónoma de Baja California, Mexico. The government of Mexico expressed interest in the Sea Grant Program as a non-regulatory authority and honest-broker of information.

4. ***East and Southeast Asia Regional Network (CCOP)***. Discussions regarding development of a regional Sea Grant network in Southeast and East Asia began in the spring of 2002 when the Directors of NSGO and NOAA/OAR International Activities Office met with the Coordinating Committee for Coastal and Offshore Geosciences Programmes in East and Southeast Asia (CCOP). CCOP is an intergovernmental organization consisting of eleven member countries with a focus on regional geoscientific issues. Following the meeting, NOAA and CCOP have continued to share information about the Sea Grant program and the benefits that a network modeled after Sea Grant could provide to address coastal and marine resources issues in the East and Southeast Asia region.
5. ***University of Connecticut Partnership with Chile***. A workshop held in Chile in December 2000 had the objective of developing a foreign academic exchange program between the University of Connecticut Sea Grant program, the National Undersea Research Program and several Chilean universities. At this workshop, the University of Connecticut Office of International Affairs established a formal M.O.U. with the University of Los Lagos, Chile, to participate in a collaborative exchange program. This collaboration is intended to build on aquaculture technical expertise in Chile and Sea Grant program expertise in extension. The collaboration originated from work on a joint bioremediation project between faculty from the University of Connecticut and the University of Los Lagos.
6. ***University of Hawaii Sea Grant Program in the Pacific Islands***. Beginning in 1987, the Office of Territorial and International Affairs (OTIA), U.S. Department of Interior, responded to Pacific island requests for help with applied aquaculture programs and established a Sea Grant Pacific Aquaculture Program (PAP). This program was designed to provide assistance to governments and aquaculture entrepreneurs throughout the U.S.-affiliated insular Pacific. The name was changed after 1995 to the Pacific Regional Aquaculture Extension Service (PRAES). It continued with a high level of achievement through 1998.

In July 1987 a Congressional workshop examined ways that information and expert help could be extended to meet the broader challenges of appropriately using and protecting marine resources. The Director of the University of Hawaii Sea Grant Program presided over the workshop that was attended by other Sea Grant directors, Congressional staff and government agencies. Testimony concerning this workshop was later presented before the House of Representatives, Insular Affairs Committee.

In September 1987, NOAA sent a fact-finding team to the U.S.-affiliated islands in the Western Pacific and identified strategies to help manage the marine resources of the islands. This team flagged extension services as the highest priority and the area to which U.S. agencies could most effectively respond. As a result, a proposal was presented to the Chief of NOAA's International Programs for "Creation of a NOAA Network for the U.S.-affiliated Islands." This proposal was circulated among government and Congressional offices and committees. A number of changes were made, but the essential concept of a network of specialist extension agents was adopted.

A fifteen-member interagency Pacific Island Network (PIN) Coordinating Committee was established. The Committee was composed of thirteen U.S government agency and two

UHSGCP representatives. The first meeting of this committee was held in September 1988 at the East-West Center, Honolulu, Hawaii. Each U.S.-affiliated island nation was invited to send a representative to provide input. As a result of this meeting, it was agreed that a nine-member Coordinating Committee would be responsible for overall policy guidance of the PIN with the Secretariat of the program located at the UHSGCP in Honolulu. The Secretariat was made up of five NOAA agencies, OTIA, the Army Corps of Engineers, and the Environmental Protection Agency. The program was initiated with a NOAA grant of \$50,000 for extension agent support and \$10,000 from OTIA to support activities. UHSGCP contributed experience and administrative support to initiate the program. By 1995 the combined budget for the PIN and PAP Pacific programs approached one million dollars.

The Pacific Island Network and aquaculture program provided island states with access to UHSGCP for educational resources and technical assistance. The strategy was to have a regional extension coordinator and an extension agent from UHSGCP in each Pacific state. By the mid-1990's the network of extension agents and specialists functioning in Micronesia and American Samoa was almost complete. Funding was primarily directed at applied research and extension. Only limited funding was provided for university training and basic research. Extension agents formed local advisory committees and worked with local people to define program agendas. At its peak, there were about twenty-five extension agents. Most were funded with resources leveraged from other sources; only about a quarter were funded full time through UHSGCP.

The Pacific programs were showing outstanding results until 1995 when without prior notification, a new OTIA administrator decided to discontinue funding for the PIN and PAP programs. People involved in the PIN and PAP programs have concluded that one of the enduring lessons is the value of building networks and making connections.

7. **Partnership of Northeast Region Sea Grant Programs with Ireland.** In 1986, a Memorandum of Understanding for a collaborative aquaculture exchange program was signed between University College, Galway, Queen's University in Northern Ireland and Sea Grant programs in the Northeast region. The Director of the Connecticut Sea Grant College program was chosen as the U.S. liaison and coordinated a variety of cooperative relations between 1987 and 1998, funding student exchanges, technology transfer, and workshops. Funding for some of the activities was provided by a grant from the International Fund for Ireland in the Department of Foreign Affairs, Dublin. Today, the M.O.U. is still in place and informal one-on-one interactions continue between the three institutions.
8. **Wood Hole Oceanographic Institute Program for International Cooperation.** The Woods Hole Oceanographic Institute operated an International Marine Science Cooperation Program from the 1980's to the early 1990's. This Program had the broad objectives of:
 - Improving opportunities for collaborative research between U.S. and foreign scientists
 - Increasing foreign country access to U.S. marine science expertise and education
 - Increasing opportunities for U.S. scientists to work in foreign waters
 - Strengthening a global approach to ocean studies

Some of the projects that the program undertook include: production of a database of funding sources for international marine science; comprehensive review of international marine science projects at Sea Grant institutions; a cooperative marine science program

with Portugal; construction of a database of maritime boundaries of 145 coastal countries; and establishment of the International Red Tide Information and Assistance Service.

Sea Grant Programs in Other Countries

Recent programs in South Korea and Indonesia are examples of how foreign governments and universities are introducing the Sea Grant approach of coastal and marine research, extension and education.

1. **Korea Sea Grant Program.** In order to manage and conserve its marine and coastal resources more effectively, in 1999, the government of South Korea adopted a Marine Development Basic Plan, also called Oceans Korea 21. The Korea Sea Grant Program (KSGP) was established under this Plan in June 2000. The Program is administered by the Marine Policy Bureau of the Ministry of Maritime Affairs and Fisheries (MOMAF).

The KSGP established a Review Panel, comprised of the MOMAF Vice-Minister and several other Director-Generals from the Ministry, to be responsible for the creation of a master plan, designation of Sea Grant colleges, review of support programs, and the development of funding requests for KSGP's operations. The KSGP finished its first phase of program implementation in 2000-2001, which provided grants for university-level research and development projects. To date, the Korea Sea Grant Program has funded sixty research projects. The operating budget was \$1.1 million in 2003. The second stage of program implementation will occur over the next several years and will focus on designating Sea Grant colleges and implementation of extension programs.

The NOAA/OAR International Activities Office has provided assistance in program development to the KSGP. NOAA/OAR and the National Sea Grant Office are also working together to establish a joint project with the KSGP on offshore aquaculture technology. This cooperative project would benefit scientists, technicians and the aquaculture industry in both Korea and the United States.

2. **Indonesia Sea Partnership Program.** The Indonesia Ministry of Marine Affairs and Fisheries (MMAF) has established a "National Sea Partnership Program" (*Program Kemitraan Bahari*) modeled after the U.S. Sea Grant Program. The Program is lead by Dr. Widi Pratikto, Director General for Coast and Small Island Affairs. Dr. Pratikto completed his Ph.D. in Coastal Engineering at the University of North Carolina with part of his research funded by the North Carolina Sea Grant Program. As a result, Dr. Pratiko is knowledgeable about the U.S. Sea Grant program.

A National Coastal and Small Islands Management Act has been submitted to the Indonesia National Parliament. This Act would provide a legislative base for the Sea Partnership Program and specify national funding sources. In addition to national funding, resources for the program will come from regional budgets approved by regional Parliaments. The Indonesia National Parliament approved a budget of US\$325,000 for FY2003 to organize and initiate activities within the Sea Partnership Program. Some regional government agencies have also allocated funds or in-kind support for FY2003 activities.

Five regional universities have been initially selected in the Indonesia Sea Partnership Program. Each has formed consortia that include other universities in their respective region, representatives from local government and the private sector. These consortia will establish charters that specify the principles of operation including, how program priorities

will be established, how projects will be evaluated, how funds will be distributed, and how funded projects will be monitored.

The regional consortium and the National Sea Partnership Program office are designed as a network to facilitate information transfer, cross-training, and shared research. The Directorate for Coast and Small Island Affairs will develop national priorities to guide planning for research and extension. However, each consortium will operate as a semi-autonomous, regionally focused center and will also establish their own specific priorities and secure local funding to address them. The Sea Partnership Program helps develop capacity for decentralized governance by strengthening coastal resource planning and management at the regional and local level.

USAID and the Indonesian Ministry of Marine Affairs and Fisheries co-sponsored a study tour in November 2002 that included visits to Sea Grant programs at the University of Hawaii, North Carolina State and the University of Rhode Island. The NOAA/OAR Office of International Activities and the NOAA National Sea Grant Office are working with the Director General for Coast and Small Island Affairs to develop mechanisms for collaboration with U.S. Sea Grant programs, such as student exchanges, technical cooperation, and developmental assistance.

5. RELATED EXPERIENCE IN COASTAL AND MARINE RESEARCH, EDUCATION AND EXTENSION

There are no other structures in the coastal and marine sector that we are aware of with precisely the same collection of attributes as Sea Grant—university based network, competitive grants, systematic links of science and extension, local-national priority setting, and long-term continuity. There are, however, many bilateral and multilateral projects and programs in fisheries, mariculture, coral reef conservation, integrated coastal management, coastal tourism, and many other coastal and marine themes that share some similarities with the goals and attributes of Sea Grant.

This paper cannot review the full breadth of international experience in coastal and marine management, education, research, and technology development. However, it is useful to highlight some of the important projects and programs for purposes of expanding ideas on alternative mechanisms as well as potential partners in the establishment of a network of Sea Grant type programs in Latin America and the Caribbean.

Bilateral Projects and Programs

USDA International Partnerships in Mariculture Development. The coordinating role and systematic linkages of university science and field extension are key attributes of the Sea Grant College Program. Two recent USDA initiatives in Central America and the Pacific are good examples of the value of networks and the combination of university-based science and extension on mariculture development themes.

One initiative was part of the U.S. government, hurricane disaster relief efforts in Honduras and Nicaragua. The project: "Training and Curriculum Development for Small/Medium Shrimp Producers with Emphasis on Best Management Practices to Guide Post-Hurricane Mitch Recovery" was implemented with University and private sector partners in Nicaragua and

Honduras. The project was a collaboration between universities in the U.S., Honduras and Nicaragua, and shrimp farm associations.

There were four areas of emphasis: 1) training in technologies that improve production, lower costs and reduce health and safety risks; 2) training in practices that maintain environmental quality on the farm and in the associated ecosystem; 3) strengthening extension capabilities of local technical experts and educators to enhance technology transfer and adoption of new practices; and 4) direct capacity building for shrimp farmers to enable them to adopt and implement improved practices.

Training materials were prepared on good practices for small and medium scale shrimp aquaculture and were the basis for a series of “training-of-trainer” courses throughout the region. The materials are designed for use by extension staff to train small and medium shrimp farmers (Haws and Boyd, 2001).

A second initiative builds on the earlier work of the Sea Grant Pacific Aquaculture Program (PAP). The three-year project (2001-2004) “Bridging Gaps to Insure Long-term Viability of Small Tropical Mariculture Ventures in Hawai'i and the U.S.-affiliated Islands” is supported by a \$500 thousand grant from the USDA International Agriculture and Food Systems Program. The project involves coordination, planning and action items in six areas: demonstration and training; education; development of best management practices; hatchery development; policy development; and, economics, marketing and business development. Primary U.S. partners are the University of Hawaii, University of Rhode Island, and the Fisheries Technology Center, Kodiak Alaska. Principal university-based partners in the Pacific islands are the Pohnpei Agricultural Trade School, College of Micronesia and College of the Marshall Islands. Like earlier Pacific efforts of Sea Grant, one of the principal contributions of the project is enhanced coordination, planning, information exchange and networks.

Sida/SAREC Regional Marine Science for Management Program. The Regional Marine Science Program of the Swedish international development agency (Sida) is a good example of a regional Sea Grant type program involving a network of developing country partners and countries. SAREC is the agency in Sida that is responsible for education and research programs with universities. Beginning in 1993, SAREC established a regional marine science program in East Africa. In the first years of the program much of the funding supported thesis research and graduate education. At the same time, Sida/SAREC has for almost two decades supported graduate education and research in the marine sciences through bilateral agreements with Universities in Tanzania and Mozambique.

As a result of the bilateral programs in Tanzania and Mozambique and the Regional Marine Science Program, there is now a strong critical mass of M.Sc. and Ph.D. graduates in the marine sciences. The programs are “sandwich” programs in which students study both at their home university and at Swedish or other partner universities, and conduct their thesis research in their home country. In this way, there are two-way benefits between North-South faculty and institutions.

One of the program's most notable achievements during its first phase was the transformation of the Tanzania Institute of Marine Sciences (IMS) of the University of Dar es Salaam into an internationally recognized institution with a permanent staff of seventeen researchers of which 10 have Ph.D.s. IMS attracts funds from a diversity of sources, hosts visiting scholars from many nations and contributes to coastal and marine resource management in Zanzibar, Tanzania and the entire Western Indian Ocean region.

Following a 1999 evaluation of the Regional Science Program at the end of its first phase, the program was redesigned specifically along the Sea Grant model of competitive grants in priority theme areas (Olsen, Tobey, and Brinck, 1999). The Western Indian Ocean Marine Science Association (WIOMSA) coordinates the new program known as MASMA (Marine Science, for Management). The Coastal Management Research Center (COMREC), located at the College of South Stockholm is the coordinating partner for the program in Sweden. In addition to the competitive grants program, there are three other related and mutually reinforcing operational program components of MASMA:

1. Institutional strengthening of WIOMSA to administer and coordinate research activities, training and outreach in the region
2. Regional networking, research priority setting and professional development through short-term courses, seminars, and workshops
3. Communication of research results and information dissemination

The total budget for the first three years of MASMA was \$2.8 million. Of this total, approximately 49, 29, 15, and 7 percent went toward research, institutional strengthening, training and workshops, and communications, respectively (Tobey and Torell, 2003).

Each MASMA research project is funded for three years at a maximum of \$50 thousand per year.

A MASMA Program Committee of six members meets biannually to discuss and select proposals, and manage the research grants program. The research program is presently guided by five thematic areas of research: 1) sustainable fisheries and food security; 2) ecosystem research; 3) pollution “hotspots”; 4) sustainable tourism; and 5) monitoring, databases and predictive sciences.

USAID Integrated Coastal Management Cooperative Agreement. USAID has funded many coastal management projects around the world. Most coastal and marine activities in tropical developing nations are funded through USAID country offices. One of the longest-standing integrated coastal management projects funded through a country office is the Philippines coastal management project.

Since the early 1980's USAID has also supported a cooperative agreement with the Coastal Resources Center of the University of Rhode Island on integrated coastal management. This agreement came to an end in September 2003. The initiative has supported planning, policy making, and resource conservation in many tropical developing countries, including Ecuador, Central America, and Mexico in the LAC area. University partnerships in research and extension were an important element of the strategies for advancing work on coastal management in all the countries where there were major programs. Key university partners have included, for example, ESPOL University in Guayaquil, Ecuador; University of Quintana Roo, Mexico; University of Dar es Salaam, Tanzania; and the Center for Coastal and Marine Resources Studies at Bogor Agricultural Institute, Indonesia.

International Programs

WorldFish Center. The WorldFish Center was created in December 2003. It was previously known as the International Center for Living Aquatic Resources Management (ICLARM). WorldFish Center is an international scientific and technical center whose mission is to stimulate and conduct research on all aspects of fisheries and other living aquatic resources. It was

formed in 1975 as a program of the University of Hawaii, and was later incorporated in Manila, Philippines, in 1977. It became a member of the Consultative Group on International Agricultural Research (CGIAR) in 1992.

The goal of the WorldFish Center is to contribute to food security and poverty eradication in developing countries through research, partnership, capacity building, and policy support on living aquatic resources. The Center focuses on sustainable aquatic resource management in tropical developing countries (in both inland aquatic and marine systems). Research is carried out on their dynamics, on investigating alternative management schemes, and on improving the productivity of key species. The work includes cooperative research with institutions in developing countries, and supporting activities in information and training.

There are sixteen CGIAR regional centers around the world with total funding of \$331 million in 2000. Support for CGIAR comes from contributing Members, of which there are about 55. Funding for WorldFish was \$2.5 million in 2000. The programs of WorldFish Center are supported by private foundations, governments and international organizations. The World Bank is the largest contributor to the WorldFish Center and the other CGIAR research programs. The Bank contributed over \$50 million, or about 15% of the CGIAR budget in 2000. The United States is the strongest individual country supporter of the CGIAR network. Primary responsibility for CGIAR is vested with USAID. The U.S. Department of Agriculture and nearly 100 U.S. universities have a rich history of scientific and technical cooperation with the CGIAR centers. Other major contributing Members are Japan, European Commission, Canada and individual European countries. CGIAR has a well-developed governance structure that includes an Executive Council, Science Council, and four Committees. Each Center has a Director-General and Secretariat.

Multilateral Development Banks. The World Bank, Inter-American Development Bank, Asia Development Bank, and others have expanded their environmental programs in the wake of the 1992 UNCED summit and are increasingly involve in marine and coastal issues. The World Bank, for example, has spearheaded ICM projects in the Mediterranean Sea, the Baltic Sea, the Red Sea, the Aral Sea and the Caspian Sea. ICM is part of the Bank's portfolio of coastal investment projects in many countries, such as Indonesia and Mexico. In 1998 the Inter-American Development Bank approved a strategy for coastal and marine resources management in Latin America and the Caribbean. Ecuador is an important partner in IDB's ICM strategy. Ecuador obtained a \$10 million loan from the IDB in the early 1990's to continue its National Coastal Management Program, initially launched through grants provided by USAID. A second loan of about \$10 million is now in the final stages of negotiation. Research, education and extension with ESPOL University and other coastal universities and technical institutes have been an important element of the USAID and IDB projects.

The World Bank and UNDP are implementing agencies for projects funded through the Global Environment Facility (GEF). The GEF has provided significant funding for projects and studies in ocean and coastal management, including multi-million dollar coastal management projects in Patagonia, Argentina, Belize, Dominican Republic, and Cuba.

UN Organizations. Many UN organizations support initiatives in marine and coastal science, information sharing, training, and education.

The Intergovernmental Oceanographic Commission (IOC) is a UNESCO organization that supports many scientific research programs in ocean sciences and technology. Its Programme on Coastal Ocean, Advanced Science and Technology (COASTS), for example, provides an

international framework within which national and regional programs and projects may be coordinated to contribute to a global understanding of coastal processes. Its TEMA (Training, Education, and Mutual Assistance in Marine Sciences) program supports national and regional workshops and marine science education.

The Food and Agriculture Organization (FAO) of the United Nations supports work on fishery research and policy, including integrated aquaculture development, has prepared training and educational materials, and sponsors regional and international workshops on fisheries and coastal management.

The United Nations Environment Program (UNEP) supports many initiatives in marine and coastal management. UNEP is the sponsor of the Regional Seas Program, initiated in 1974. Regional Seas is a global program implemented through regional components. There are now thirteen regions involving more than 140 coastal States and Territories. Ecuador is part of the South East Pacific regional program. Honduras, Nicaragua and El Salvador are part of both the South East Pacific and the Caribbean regional programs. Regional Action Plans are the substantive basis for program strategies and actions. Action Plans are targeted at both the mitigation of the consequences of environmental degradation, and the causes of environmental degradation. They are the program's comprehensive strategies to combating environmental problems through the rational management of marine and coastal areas. The Regional coordinating Unit of the Plan of Action of the South East Pacific is located in Quito, Ecuador.

UNEP's Regional Office for Asia and the Pacific hosts a program called the Network for Environmental Training at the Tertiary Level in Asia and the Pacific (NETTLAP). This program develops methods in environmental training, identifies regional training needs and shares knowledge through ongoing interaction among network partners. Partners consist of institutions and individuals active in environmental education and training at a tertiary level (e.g. university, technical institute, teacher training college) in the region.

The United Nations Development Program (UNDP) has a significant program in capacity building for sustainable development, called Capacity 21; it was launched to build national capacities for the implementation of Agenda 21. Integrated coastal management is one of the areas of focus. Working with governments, civil society and the private sector, Capacity 21 programs support the development of integrated, participatory and decentralized strategies for sustainable development. Capacity 21 programs are country-owned, country-driven processes with the goal of influencing national and local decision-making to build long-term capacities at all levels of society. Since 1993, Capacity 21 has worked with over 75 developing countries, including Ecuador, Honduras, Nicaragua, and El Salvador.

UNDP also provides funding for the Train-Sea-Coast program, launched in 1993, also in response to the recommendations of Agenda 21. Train-Sea-Coast is a decentralized global program for coordinated development and sharing of standardized course materials in ocean and coastal management. Ten academic institutions located in nine countries in all major geographical areas of the world (Brazil and Costa Rica in LAC area) are currently members of Train-Sea-Coast. Each institution develops a set of courses in ocean and coastal management using a detailed common methodology.

The EU-Latin America ALFA Program. The ALFA (Latin America Academic Education) Program, approved by the European Commission in 1994, is a major program of scientific collaboration between the European Union and Latin America. This program is implemented by networks of universities, which present proposals of joint cooperation.

A proposal for an ALFA project must involve a network of at least six universities (three from Latin America and three from EU). Each network is coordinated by one of the institutions. In the first 5 years (1994-1999), a total of 846 projects were approved with a budget of 38.4 million Euros. The second phase (2000-2005) has a budget of 42 million Euros. Seventeen countries from Latin America have been involved, including Ecuador, Honduras, and Nicaragua and El Salvador. The ALFA Program supports scientific and technical training in many disciplines. Recently, a project on a "Master Program on Tropical Integrated Areas" has been approved, with the University of Costa Rica as the coordinating institution. A related program is the "Doctoral Program on Environmental Sciences" of the University of Concepcion (Chile), which includes modules on Integrated Coastal Zone Management and Marine Pollution.

6. CONCLUSIONS

The experience with SGIP and more recent international partnerships demonstrates that the Sea Grant approach of university-based research, education, and extension is not only transferable to developing nations, but is enormously needed.

The cooperative educational and scientific exchange was viewed as one of the most valuable benefits of international partnerships between U.S. Sea Grant programs and institutions in developing nations. In some initiatives, such as the Pacific programs of the 90's, the connections and networks of Sea Grant were viewed as critical. The value of networks and coordination can be easily understood in a region of incredibly isolated, marine rich island states with little access to institutions of higher education.

Critical to the success of international partnerships was joint funding. All international partnerships of SGIP and international projects that came after SGIP have benefited from significant support by local institutions. In some cases, local resource commitments and locally leveraged support even exceeded U.S. Sea Grant partner contributions. This illustrates the key principals of local commitment and ownership, and equality of North-South partners.

The experience in the Western Indian Ocean Region with the MASMA program demonstrates that a competitive, peer review grants process can succeed even in developing nations with very little previous experience with such procedures. It also shows that it is possible to identify priority research themes in a large geographic region through a coordinating body, such as WIOMSA.

In both Indonesia and Korea, where national Sea Grant institutions are being created, several common features emerge as critical to success: strong political will at both national and regional levels, significant commitment of national funds, local ownership and planning, enabling national policy or legislation, and technical assistance from NOAA and USAID.

As the Indonesia Sea Partnership Program shows, Sea Grant is also consistent with the global need to build capacity for decentralized governance and public administration. The bottom-up and top-down combination strengthens decentralized planning and coordination of marine and coastal affairs.

The challenges to transferring Sea Grant to developing countries are also opportunities for new Sea Grant programs. For example, the authors of this paper recently spent five days meeting with institutions in Quito and Guayaquil, Ecuador to discuss marine and coastal affairs and the potential role of a Sea Grant type program. A consistent finding was the lack of mechanisms for adequate coordination of national and international initiatives on coastal and marine science, education, and extension. Another very clear gap is the absence of extension. Tarifeño-Silva (2002) concludes that these challenges also apply to all of Latin America and the Caribbean.

Tarifeño-Silva (2002) adds another challenge, which can also be seen as an opportunity for a Sea Grant program— inadequate professional communication between the various disciplines (oceanographers, marine biologists, planners, and marine affairs). Coastal and marine science is interdisciplinary, but there is a lack of experience for exchanging views on the same subjects from different professional perspectives. This situation often leads to finding solutions from a monodisciplinary approach.

Annex 1 Sea Grant College Programs

Great Lakes Region

1. Illinois-Indiana Sea Grant College Program
2. Michigan Sea Grant College Program
3. Minnesota Sea Grant College Program
4. New York Sea Grant Institute
5. Ohio Sea Grant College Program
6. Pennsylvania Sea Grant Project
7. Wisconsin Sea Grant Institute

Northeast Region

8. Connecticut Sea Grant Program
9. Maine Sea Grant College Program
10. Massachusetts Institute of Technology Sea Grant College Program
11. New Hampshire Sea Grant College Program
12. Woods Hole Oceanographic Institution Sea Grant Program
13. Rhode Island Sea Grant College Program

Mid-Atlantic Region

14. Delaware Sea Grant College Program
15. Maryland Sea Grant College Program
16. New Jersey Sea Grant Program
17. North Carolina Sea Grant College Program
18. Virginia Sea Grant College Program

Southeastern Atlantic and Gulf of Mexico Region

19. Florida Sea Grant College Program
20. Georgia Sea Grant College Program
21. Puerto Rico Sea Grant College Program
22. South Carolina Sea Grant Consortium
23. Louisiana Sea Grant College Program
24. Mississippi-Alabama Sea Grant Consortium
25. Texas Sea Grant College Program

Pacific Region

26. Alaska Sea Grant College Program
27. California Sea Grant College Program
28. Southern California Sea Grant College Program
29. Hawaii Sea Grant College Program
30. Oregon Sea Grant College Program
31. Washington Sea Grant College Program

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Establishing Long-Term Coastal and Marine Programs in Latin America and the Caribbean

Pilot Studies of Ecuador and the Gulf of Fonseca

***Integrating Education, Applied Research and
Extension***

Background Paper No. 2



Final Draft

May 24, 2004

An Initiative of NOAA/OAR Office of International Activities,
University of Rhode Island Coastal Resources Center and the
University of Rhode Island Sea Grant College Program

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PREFACE

This document is the second of two background papers that have been prepared to explore the feasibility of adapting the Sea Grant model of University-based education, research and extension to countries of Latin America and the Caribbean. It is part of an initiative directed by the NOAA/OAR Office of International Activities and the University of Rhode Island Coastal Resources Center and Sea Grant Program. Financial support comes from the U.S. State Department's Ocean, Environment and Science Initiative, and the NOAA National Sea Grant Office. The initiative was catalyzed by expressions of interest from government and university officials in Honduras, Nicaragua, El Salvador and Ecuador to develop long-term Sea Grant-like programs.

The first background paper describes the structure and operating principles of NSGCP, summarizes NSGCP experience with international partnerships, and explores other similar program experience with linked education, research and extension. This paper explores options for establishing Sea Grant-like programs in two case study sites: Ecuador and the Gulf of Fonseca. Fact-finding visits were conducted in January/February 2003 (Costa Rica, Guatemala, Nicaragua, El Salvador and Honduras), June/July 2003 (Costa Rica, Nicaragua, Honduras, and El Salvador), and July 2003 (Ecuador). More than 100 governmental and non-governmental actors as well as representatives of regional and international organizations were consulted. The purpose of these visits was to:

- Assess the social, economic, political, and environmental issues affecting Ecuador and the Gulf of Fonseca in order to better understand the issues that a program based upon the model of the U.S. National Sea Grant Program might address
- Survey the landscape of past and current activities related to the sustainable development and conservation of coastal and marine resources
- Assess University education, research and extension capacity in coastal and marine topics
- Outline the gaps and adaptations needed to establish Sea Grant-like programs in Ecuador and the Gulf of Fonseca
- Explore options for structuring long-term programs of coastal and marine education, research and extension

The country visits were the beginning of an iterative process between partners and key actors that served as the basis for the next phase of dialogue—national and regional roundtable discussions. Roundtables were convened in Ecuador, 16 October 2003 and Honduras, 21-22 October 2003. The Honduras roundtable was regional, with participants from the three nations surrounding the Gulf of Fonseca. The Roundtables provided a venue for all relevant actors to discuss similar topics as those listed above. Agendas and summaries of meeting outputs are available upon request. Roundtable participants are listed in Annex 1.

This report draws from the consultations, Roundtables, and literature review that took place over the period January-October 2003. It is prepared by James Tobey and Matt Wilburn with contributions from Jill Hepp, Emilio Ochoa, Stephen Olsen, Barry Costa Pierce, and Agnes Saborio Coze. We wish to express our appreciation to everyone who has helped with this effort, especially ESPOL University in Ecuador, the University of Zamorano in Honduras, and the Center for Aquatic Ecosystems Research in Nicaragua.

ACRONYMS

ANDA	National Association of Aquaculture Producers (Nicaragua)
ANDAH	National Aquaculture Association of Honduras
CCAD	Central American Commission on Environment and Development
CENAIM	National Aquaculture and Marine Research Center (Ecuador)
CENAREC	Center of Coastal Resources Training and Extension at ESPOL University
CICYT	Scientific and Technological Research Center at ESPOL University
CIDEA	Center for Aquatic Ecosystems Research at the University of Central America
CIIFEN	International Center of Research on the El Niño Phenomenon
CIOP	Fisheries Oceanography Research Center at ESPOL University
CODDEFAGOLF	Committee for the Defense and Development of Flora and Fauna of the Gulf of Fonseca
CURLA	Central Regional University of the Atlantic Coast (Honduras)
DANIDA	Danish International Development Agency
DIGMER	Merchant marine of the Ecuador navy
ESPOL	Coastal Polytechnic University (Ecuador)
FAO	United Nations Food and Agriculture Organization
IDB	Inter-American Development Bank
INOCAR	Naval Oceanographic Institute (Ecuador)
INP	National Fisheries Institute (Ecuador)
JICA	Japanese International Cooperation Agency
LAC	Latin America and the Caribbean
NOAA	National Oceanic and Atmospheric Administration, U.S. Department of Commerce
NOAA/OAR	NOAA Office of Oceanic and Atmospheric Research
NSGCP	National Sea Grant College Program
NSGO	National Sea Grant Organization
OSPESCA	Central American Organization of the Fisheries and Aquaculture Sectors
PMRC	Coastal Resources Management Program (Ecuador)
SICA	Central American Integration System
TNC	The Nature Conservancy
UAM	American University of Managua (Nicaragua)
UCA	University of Central America (Nicaragua)
UCV	Coastal law enforcement coordination units (Ecuador)
UNA	National Agricultural University (Honduras)
UNAH	National University of Honduras
UNI	University of Engineering (Nicaragua)
USAID	United States Agency for International Development
USFQ	University of San Francisco of Quito (Ecuador)
WWF	World Wide Fund for Nature
Zamorano	Pan American School of Agriculture (Honduras)
ZEM	Special area management zones (Ecuador)

1. INTRODUCTION

For more than three decades the National Sea Grant College Program (NSGCP) has promoted sustainable development, created new technologies, products and services, enhanced coastal and marine resource management, reduced the loss of life and property, and promoted coastal and marine education. The Program has formed a learning network across dozens of coastal states that integrates coastal and marine education, research and extension on selected topics. In this paper we explore options for transferring the NSGCP model to coastal nations and subregions of Latin America and the Caribbean (LAC) and creating a regional learning network.

Our analysis is focused on two pilot locations: the mainland coast of Ecuador in South America and the Gulf of Fonseca in Central America. For each location we have reviewed with in-country partners how to design and establish long-term programs that integrate coastal and marine education, applied science and extension services. Our review has focused on four major areas of inquiry:

- The coastal and marine context and the key issues for applied science and extension
- The institutional landscape and efforts to date to address critical coastal and marine issues
- University capacity in education, research and extension and the benefits that a program structure modeled after Sea Grant could provide
- Program development strategies

Section 2 provides a brief overview of the social, economic and environmental context in the LAC region. Section 3 describes the benefits of adapting the model of the NSGCP to countries in Latin America and the Caribbean. Sections 4 and 5 explore opportunities for establishing Sea Grant-like programs in Ecuador and the Gulf of Fonseca. The last sections present our conclusions and describe next steps.

2. COASTAL AND MARINE CONCERNS IN THE LAC CONTEXT

It is easy to grasp the strategic importance of coastal and marine resources to LAC countries by simply reminding oneself of the dimensions of the resource base—the LAC region has almost 60,000 linear kilometers of coast. Another important feature is that all but two (Paraguay and Bolivia) Latin American countries are coastal.

There is much diversity across coastal areas in the LAC region, but nearly everywhere common features are the steady decline in the coastal and marine resource base, increasing vulnerability to natural hazards, and rising poverty and income inequality. The Inter-American Development Bank has identified six major coastal and marine issues for the LAC region (IDB, 1998):

- Declining coastal water quality from land-based sources
- Impoverishment of coastal communities
- Depletion of commercial fisheries stocks
- Degradation of coastal ecosystems
- Land use and resource allocation conflicts in the coastal zone
- Coastal erosion, flooding and shoreline instability

The driving forces of these problems include growing population density, poverty, over exploitation of natural resources, insecure property rights in water and land, and policy choices at the national level (IDB, 1998; Burke et al., 2000).

It is important to understand the general context of the LAC region because it shapes coastal and marine resource use and issues. Profound social and economic changes have taken place over the past twenty years. In most countries, a political democratization process has opened up new opportunities for public participation, inflation has been reduced, foreign investment increased and free market reforms introduced, such as privatization of state enterprises. The average annual growth rate of GDP per capita was positive between 1989 and 1998 in all LAC countries except four: Venezuela, Surinam, Nicaragua and Haiti. There has been a change in the sectoral structure of LAC economies whereby services (including tourism, financial services and free trade zones) have increased their relative weight in GNP. Tourism now accounts for about 12 percent of GDP in LAC, one-quarter of foreign exchange earnings and provides one-fifth of all jobs. Most of the tourism is beach tourism.

These reforms appear to be laying a foundation for a rate of progress that seemed impossible during the “lost decade” of the 1980s. However, there are many conflicting trends. The progress of the nineties brought with it social costs. The region is still characterized by an unequal distribution of wealth and the gap between incomes is widening. Real wages have fallen and unemployment is now higher than in 1990 (UNEP, 2000). In 2003 the LAC region saw an increase in unemployment, poverty, and political disturbances. Social tension has reached the stage whereby some Latin American cities and rural areas have the highest rates of crime and violence in the world.

The General Context of the LAC Region

- Growing human pressures on coastal and marine environment
- Decline in the coastal and marine resource base
- Worsening income inequality, poverty, unemployment and political disturbances
- Continued reliance on resource intensive sectors

Another conflicting trend is that despite the increase in the relative importance of services in national economies, there continues to be enormous pressure on exportable natural resources. Direct environmental pressure on the resource base and environmental damage continue to grow. There has been an upward trend during the past two decades in the volume of exports from sectors with a recognized environmental impact—fishery, forestry, agriculture, and mining sectors (ECLAC, 2002). The region continues to be more reliant on primary commodities and raw material exports than other parts of the world with similar income levels. Overexploitation of resources has already had direct impacts on output, for example, in marine fishing where catches have continued to decline.

Population pressure, livelihood needs and land scarcity mean that the traditional effects of primary activities, particularly changes in land use, are now being concentrated in smaller, more fragile areas that are environmentally more sensitive, and perhaps more vulnerable. In many cases, landless people have settled in flood-prone coastal areas because these are the only lands available to them for settlement. In those instances, unsustainable use of coastal areas and resources may appear to be the only alternative short of migration to urban areas. The economic dependence and vulnerability of poor, rural communities on coastal resources and lands are among the major challenges of social development in coastal regions.

The challenges are compounded by the fact that the region's rural population is not expected to fall significantly over the coming decades. The percent of the population that is urban in the LAC region living in built up coastal areas has almost doubled over the last two decades. At this time, 76 percent of the region's population is urban (World Bank, 2003) and 60 of the region's largest 77 cities are coastal (Hinrichsen, 1998). Urban development is frequently rapid, spontaneous and disorganised, leading to uncontrolled growth and the transformation of natural areas of great ecological value (e.g. deltas and estuaries, mangrove swamps, coastal lagoons). Despite this growth of coastal urban population, the total rural population has not declined, meaning that the degree of population pressure on resources is unlikely to subside.

Central to the LAC region's environmental problems are land use changes, especially the conversion of forests to agricultural land uses. Between 1961 and 1999 over 150 million hectares were incorporated into agricultural production in the region, and much of this land was converted from forest (FAO, 2001). Although agricultural land area is still increasing, the rate has slowed, especially in the last few years. Mexico, Central America, and Ecuador are exceptions.¹ The environmental impact of agriculture is more than just the conversion of land. Economic reform throughout LAC has had the effect of modernizing the region's agriculture, making it more intensive, with the result of greater use of fertilizers and pesticides.

Deforestation is the main cause of biodiversity loss in the region and multiple problems affecting natural resources, especially water and soils. Of the 418 million hectares of natural forest lost worldwide over the past 30 years, more than 40 percent was in Latin America (Armstrong and Brandriss, 2003). Deforestation has largely been a function of poverty, unemployment, and inequitable land distribution that cause the poor to clear tropical forests for subsistence farming and domestic needs. This eventually leads to loss not only of livelihoods but also environmental services such as soil productivity, watershed protection, regulation of microclimates, availability and regulation of water resources, and biodiversity.

Major Trends

- Deforestation
- Loss of critical habitats
- Deterioration of coastal watersheds
- Overfishing and depletion of fish stocks
- Inadequate investments in coastal and marine resource management
- Increasing vulnerability to natural hazards

Land use changes have led to erosion in watersheds and this erosion is reflected in the sedimentation of reservoirs and marine ecosystems. Degradation usually starts in the upper watersheds but the sedimentation, other effluents and changes to fresh water flows greatly influence coastal and marine ecosystems, damaging coral reefs and other living marine resources. About one-third of the region's reef areas are considered at high risk due to sedimentation caused by deforestation, runoff of nutrients from sewage and agriculture, and destructive fishing practices (Burke et al, 2000). Mangrove deforestation is especially damaging to the productivity of near-shore areas as well as to shoreline flooding. Mangrove habitat is one of the LAC region's high value ecosystems. Almost 40 percent of the more than 17 million hectares of mangrove swamp that exist in the world are found within the LAC region, 8 of that 40 percent is found in Central America.

All countries face difficult problems with regard to overexploitation and management of inshore fisheries (Christy, 1997). Inshore fisheries are of lesser value than the other types of fisheries in

¹ For these countries, FAO data show an annual deforestation rate of 1.2 percent in the period 1990-2000, which is much higher than the LAC rate of 0.5 percent (FAO, 2001).

Latin America and the Caribbean, but employ the largest number of fishermen as well as people associated with the fishing industry as providers of materials and equipment, and as processors, marketers, and distributors.

The other types of marine fisheries in the LAC region are the fishery for highly migratory species, particularly tuna, which are found in all ocean regions. Another fishery is for shoaling pelagic species (species that feed on the surface and are found in large schools). These fisheries tend to be located only where there are major upwelling currents that bring nutrients to the surface from deep ocean areas. The most important of these upwellings occurs off Chile and Peru. It is one of the top five commercial fisheries of the world. The fourth type of fishery is the fishery for demersal stocks (those feeding on the bottom) found on the extended continental shelf. The most significant area of extended shelf lies off the coasts of Argentina, Uruguay and to some extent Brazil. This area has rich resources of groundfish, such as Argentine hake and southern blue whiting, as well as large stocks of squids.

In many cases, fishing fleets are larger than what the oceans can sustain. In addition, few marine resources are administered through a management plan with a regular mandate for stock assessments. As a consequence, knowledge of the status of fishery stocks is limited. However, experts agree that the important fisheries are overfished or at their biological limit (Costanza et al., 2000).

Institutional Responses

The 1980s were a period of great difficulty for environmental management. The adjustments resulting from the economic crisis that struck the region affected recently created environmental institutions, which were weak to begin with, leaving them with many responsibilities but few resources. In the 1990s, the region underwent an intense democratization process in parallel with economic reform. Furthermore, in almost all of the countries civil society became an important counterpart for government institutions to address issues in areas such as health, the environment and human rights. Progress was made on environmental matters in the nineties as a result of a growing political commitment to sustainable development goals among all social actors, national, regional and international. The improvement in general legislation has strengthened the possibilities for management of coastal areas and resources. Many of the laws governing fishing, protected natural areas, environmental impact or land use were passed during the '90s.

Some countries have established national coastal management programs and supporting legislation, but these are the exception rather than the norm. Also, some countries have started to move toward a more integrated management model. Integrated coastal management initiatives in LAC countries with the greatest institutional and administrative significance are Brazil, Costa Rica and Puerto Rico, followed by Mexico, Belize, Ecuador, Chile and Colombia (Barragan, 2001)

The global conventions concluded since 1992 have also resulted in a number of important institutional changes and innovative cooperative mechanisms to address environmental issues. Most countries have set up specific bodies such as commissions, institutes or national programs to begin addressing environmental and resource issues. Nations, donors, and lender institutions are also promoting policies and implementation plans that attempt to mainstream the environment in key economic sectors, such as water, forestry, tourism, and energy. Regionally, the countries' environmental authorities have set up the Forum of Ministers of the Environment of Latin America and the Caribbean, which consists of the 33 ministries or equivalent

authorities. There are also subregional treaties whose aim is the conservation of shared natural resources, such as the Central American Commission on Environment and Development (CCAD)

The individuals and institutions consulted in the development of this paper are aware of the seriousness of coastal and marine issues and the requirement that growth be built on a foundation of sustainable resource use and environmental protection measures. They also recognize that the environmental management capabilities achieved so far have not been enough to contain resource overexploitation and environmental degradation. Institutional platforms, capabilities and public policies still need to be improved considerably. Public-sector environmental budgets have fluctuated sharply over the past decade, and in many cases have shown a tendency to fall, mostly because of the position of public finances and the weakness and discontinuity of environmental governance. Budget deficits and the need to generate resources to meet external debt obligations have generally resulted in budget cuts, to which environment-related areas are extremely vulnerable.

Education of all sectors of society will be critical to ensure that the goals of sustainable development become a priority on the political agenda of LAC countries. Progress in meeting sustainable development goals can only be made if the public is informed and civil society is proactive. Much effort is still needed to give sustainable development goals greater relevance and importance in the LAC political sphere.

Some of the measures that countries can take to strengthen domestic political commitment to sustainable coastal and marine development goals are: introducing the concept of sustainable development at all levels of national educational systems; widely publicizing national sustainable development goals; investing in research, data generation and analysis of environmental problems and trends so that public opinion has a factual basis on which to form judgements; and continuing to strengthen democracy and channels of communication through which all social groups can assert their priorities and feel a sense of shared responsibility.

3. BENEFITS OF APPLYING THE NSGCP MODEL TO THE LAC REGION

The above leads us to the conclusion that the state of the coastal and marine environment in the LAC region has witnessed a global decline in the last ten years and that the pressure exerted on the coastline will increase. The main reasons for this are the distribution of the population, natural resource dependence, over exploitation, and inadequate institutional investments in coastal and marine resource management. The corrective measures implemented have been insufficient to reverse the negative trends of deforestation, pollution of coastal waters, decline of fisheries, destruction of critical habitats, loss of biodiversity, and misappropriation of public property. It further shows growing social tensions, economic vulnerability, problems of poverty and inequitable income distribution.

To meet challenges such as these, there is a need to find new mechanisms and management models specific to Latin America. These mechanisms and models can pool countries' energies toward the wise use of coastal and marine resources, strengthen education and political commitment to sustainable coastal and marine development, contribute to improving the levels of scientific knowledge and regional cooperation, and transfer innovative technologies and environmental awareness to resource users. The NSGCP offers a model for a new and regionally significant approach to encourage the wise use of coastal and marine resources. This

model applies university-based research and technologies to issues relating to the responsible use of marine resources.

Applied research and its extension to resource users can improve economic well being and stimulate cost savings through the development of new products, innovations, and technologies in marine sectors such as fisheries, marine biotechnology, aquaculture, seafood processing, and the marina industry. The returns to society of research and development in the long-term are significant, as has been powerfully demonstrated by investments in agriculture (Runge et al., 2003). Scientific and technical innovations can also improve the adaptive ability of coastal economies, increase the flexibility of resource allocation, and reduce vulnerability to external market and global environmental change. Increased and more accessible environmental information and statistics are needed to help identify and prioritize the problem areas to which national environmental management resources should be channeled.

Key attributes of the NSGCP that are relevant to the LAC context include the following:

Formulating Agendas to Address the Urgent Needs of Society. NSGCP is a strategic program that develops medium and long-term goals and priorities in close collaboration with stakeholders and communities. This promotes participatory governance and channels resources to the most pressing social, economic, and environmental issues. NSGCP provides an opportunity for diverse actors to coalesce around issues of common concern and focus on targeted strategies to address those issues.

Continuity and Permanence. The program is designed and implemented for the long-term. Long-term commitment builds a community of coastal managers, policy experts, educators, researchers and private sector partners dedicated to resolving priority coastal and marine issues. This permanence makes long term strategic planning possible.

Trust and Objectivity. Continuity and long-term presence builds trust with stakeholder groups and creates a supportive constituency, which is critical to successful extension work. NSGCP also adopts a non-advocacy role and is viewed as a transparent and neutral university-based forum to promote the exchange of reliable scientific information.

Catalyzing the Strengths of Multiple Institutions. NSGCP serves as the catalyst for bringing intellectual and physical resources to bear on the needs and opportunities of communities. Rather than create new institutions, the program mobilizes and sustains long-term connections with existing public, private and civil society institutions to address coastal and marine challenges. This minimizes duplication of effort, leverages resources, and creates assets of considerable pragmatic value at a comparatively low cost to society.

Standards of Excellence. NSGCP operates under a formal system of checks and balances with rules that define performance expectations and responsibilities. Program granting decisions are based on rigorous peer review. Funding is reduced or withdrawn from programs and individuals that do not meet standards of professional excellence in management, education, research and extension. Excellence is judged primarily against the relevance of the activity to priority coastal and marine issues.

Representational Governance and Local Ownership. NSGCP promotes representational governance. It is designed as a decentralized system that responds to the priority issues posed by coastal conservation and development in a given place. Strategic plans,

implementation strategies, and program assessments involving all coastal stakeholders are required of each State program.

Regional Networks for Learning. NSGCP functions as a learning network on common themes with national, state and local links. Thematic focus areas gather the intellectual resources from throughout the national network, sharing information and ideas, and acting as a well-informed voice for responsible stewardship of coastal ecosystems at small and large geographic scales.

As it has in the United States, programs in LAC countries fashioned after the NSGCP model could become engines for economic growth and cost savings through the development of new products, innovations, and technologies. Research and extension to reduce the risks of natural disasters in coastal regions hold the potential for saving lives and hundreds of millions of dollars in avoided property damages. Education efforts can enhance the general public's awareness and knowledge in relation to coastal and marine issues.

An important benefit for LAC countries of the NSGCP model is continuity and coordination. Coastal and marine projects come and go and are usually conducted in isolation of one another. This reduces their cumulative impact and results in a constant reinventing of the wheel. A long-term program with a structure like NSGCP provides a clearinghouse for information and institutional memory, increasing the effectiveness and efficiency of otherwise isolated coastal and marine initiatives. A program structured like NSGCP would shift attention towards tangible future scenarios and allow actors to pool resources towards proactive and strategic investments in research and extension.

The network structure of the NSGCP promotes cross program and regional cooperation, technology transfer and capacity building. These characteristics are much needed. There is currently inadequate professional communication between the various disciplines (oceanographers, marine biologists, and social scientists) in the LAC region (Tarifeño-Silva, 2002). This situation often leads to finding solutions from a monodisciplinary approach.

Latin America is not known for the success of its regional integration initiatives despite a continuous coastline and relative linguistic uniformity. South-South cooperation in coastal management is rare and there is very little experience with LAC networks working toward the improvement of coastal management practices (ECLAC, 1999).² Some LAC countries have vast experience in certain coastal and marine technologies (such as Chile in marine culture of salmon) but other countries have no access to the experience. A coastal and marine initiative across LAC countries would not only help to find a specific Latin American management model, but would also contribute to improving the levels of technical training, scientific knowledge, exchange of experiences and South-South cooperation. Country programs fashioned after NSGCP in the LAC region would facilitate functioning connections between programs allowing different countries to share ideas and exchange information and technical expertise.

In areas where several countries share coastal and marine resources, such as the Gulf of Fonseca, the NSGCP model could promote harmonization of management efforts, policies, best management practices, and monitoring strategies. Greater coordination and harmonization of independent management approaches would reduce costs and improve effectiveness. A

² A new three-year project funded at the end of 2003 by the AVINA Foundation will create a leaning network directed at leaders in integrated coastal management in Latin America. This project is entitled "A Network of Leaders for Collective Learning and Action to Put the Principles of Sustainable Coastal Development in Practice."

collaborative forum also provides an opportunity for diverse participants to evaluate effectiveness of programs and projects and to propose adjustments as circumstances change or as new information becomes available.

For the network of U.S. Sea Grant programs, the establishment of other programs similar to NSGCP in countries of LAC would provide greater opportunities for collaboration and two-way benefits between LAC countries and the U.S. It would create a vehicle for exchanges of information, collaborative research, curriculum development, education, and extension on coastal and marine issues of shared interest. It may encourage greater national and state spending in the U.S. to partner with countries in LAC. In-country program contacts can also help to expedite scientific research permitting processes that can often be confusing and time consuming for foreign investigators.

4. ECUADOR CASE STUDY

Coastal and Marine Issues

Ecuador has a population of 12.9 million with almost half being located on the coastal plain (World Bank, 2003). There are four coastal provinces on the mainland. The Galapagos Islands is the fifth coastal province. The coastal population has been increasing since 1950 both in absolute numbers and relative to national population. The migration toward the coastal region, the rapidly increasing population, poverty, growth in the area of shrimp ponds, and urbanization has had large environmental impacts on the coastal region. The coastal city of Guayaquil is the country's largest city (about 2 million), principal port, and leading economic center. In the 1980s and 1990s, an expanding highway network opened formerly inaccessible and isolated coasts to residential developments that will bring further environmental change.



Per capita gross national income is \$1,240 compared to \$3,560 for the LAC region (World Bank, 2003). Like many LAC countries, the distribution of income is distributed very unevenly. The poorest 20 percent of the population receive 5.4 percent of income; the wealthiest 20 percent receive 49.7 percent. In 1995, 52 percent of the population was below the poverty line of \$2 a day (World Bank, 2003).

The external debt burden in the country is high and has an impact on all aspects of life, including decisions on how to allocate resources such as environmental services. It was about \$13 billion in 2000, equivalent to about 108 percent of annual gross national income at that time (World Bank, 2003). The debt problem is linked to a heavy dependence on oil receipts and policy failures that accompanied the oil boom (Kellenberg, 1996). Heavy debt and fiscal

mismanagement resulted in inflationary problems. One consequence of all this is the dollarization of the national currency in recent years.

Shrimp farming, banana plantations, cutting of timber, and hunting of wildlife have had devastating effects on mangrove swamps and coastal ecosystems. Much of the tropical dry forest in the coastal region has been cleared to create pastureland. Annual deforestation for the country overall is high relative to the rest of the LAC region. During the period 1990-2000 it was 1.2 percent. Annual deforestation was 0.5 percent for the LAC region overall. This environmental degradation, seen in the absence of well-defined legal and institutional frameworks and inadequate resources, has been caused in part by a short-term economic view. Community inhabitants have struggled to alleviate poverty for their families, and business interests have looked to maximize short-term profits.

Primary commodities and natural resource extraction dominate Ecuador's coastal and national economy. The primary sources of export value and wealth are petroleum followed by bananas, marine fisheries, coffee, and farmed shrimp. In terms of export value, fisheries exports occupy third place. The annual value of fisheries exports has risen to more than \$300 million during the last four years. Ecuador is the number one producer of farmed tilapia in the LAC region. Until recently, Ecuador was one of the largest producers in the world of shrimp grown in ponds with over 140 thousand hectares of ponds in production. Lately the industry has greatly declined due to disease problems. Remote sensing imagery shows that 26.5 percent of the mangroves that were present in 1969 had been destroyed by 1995 (Olsen, 2000). An estimated 10 percent of the destruction is attributed to the expansion of urban areas and the rest has been caused by shrimp mariculture (Olsen, 2000).

A national Roundtable was convened in October 2003 to explore interest and options for a program designed after the NSGCP. Plenary presentations and breakout working groups identified priority coastal issues. The issues tended to fall into three categories: environmental, social, and institutional. Environmental issues identified are decline in coastal water quality, decline in near-shore fisheries, loss of habitat (especially mangroves), overexploitation of resources, insufficient scientific knowledge and data, and extreme climatic events (El Niño). Social issues identified include poverty, lack of alternative livelihoods, population growth, public health, resource use conflicts, weak systems of extension, and inadequate education and public awareness. Legal and institutional issues identified include an overlap in jurisdiction, responsibilities, and mandates, often resulting in conflicts between government agencies while diminishing compliance and enforcement of laws and regulations, and institutional capacity to effectively address critical issues.

There is a close concurrence of these issues and the priorities for both the USAID-funded national coastal management project from 1986-93 and the National Coastal Management Program from 1996-2001 funded by Ecuador with a \$12.7 million IDB loan. The coastal management efforts have focused mainly on five environmental issues:

- Mangrove ecosystems
- Near-shore artisanal fisheries
- Sustainable mariculture
- Shorefront development
- Coastal water quality and environmental sanitation

In addressing these issues, social and institutional efforts were made in areas such as public education, enforcement, community planning and empowerment, decentralized governance, conflict resolution, scientific studies and baseline analysis.

The coastal and marine issues in the Galapagos Islands are different from mainland Ecuador. Conservation of biodiversity, marine fishery management, and ecotourism are priorities in the Galapagos Islands where most of the tourism in Ecuador is focused. There are 80,000 tourists visiting the Galapagos per year. There is little international tourism in the mainland coastal areas of Ecuador. There is, however, a significant and growing local tourism—primarily beach tourism.

Efforts to Address Coastal and Marine Issues

A sequence of laws, decrees and programs extending back to the 1950s have been designed to control deforestation and soil erosion, unplanned urban expansion, water quality degradation, and the overexploitation of fisheries. Unfortunately the poor implementation of these policy measures has too often had a marginal effect on long-term trends.

The approach of the USAID-funded coastal management program in the 1980's was to design a management process that would incrementally build institutional capacity and field test approaches at a pilot scale before recommending national reforms (Olsen, 2000; Robadue, 1995; Arriaga, 2000). Ecuador was selected by USAID as one of three pilot projects designed to test the usefulness of applying lessons learned from coastal management initiatives in the United States to similar problems and opportunities in developing countries. The project sponsored by USAID began in 1986 and continued through 1993.

The project developed a national strategy document that resulted in a 1989 Executive Decree to establish a Coastal Resources Management Program (PMRC) within the Office of the President of the Republic. A National Coastal Resource Management Commission was formed with the mandate to develop national policy on coastal issues and promote collaboration among government agencies. The General Secretary of the Administration of the government of Ecuador presides over the Commission, which includes representatives from seven government agencies.

The Executive Decree established special management zones (known locally as Zonas Especiales de Manejo, or ZEMs) and gave the PMRC two years to prepare integrated coastal resource management plans for each site. The ZEMs were selected as microcosms of the challenges posed by the development and management of the Ecuadorian coast. There are now six geographic areas designated as ZEMs. They encompass only about 8 percent of the shore, but represent the full variety of problems that can be found throughout the coast. The preparation and the implementation of plans that address priorities for conservation and development in each of the ZEMs featured comprehensive and participatory planning and decision-making. All the ZEM plans were endorsed, first locally, and then by the National Commission on Coastal Resources Management. Each ZEM has a Committee composed of local authorities and civil society. The ZEM Committees and ZEM plans do not have regulatory authority.

Coastal law enforcement coordination units, known as "Ranger Corps" (known locally as Unidades de Conservación y Vigilancia, or UCVs) were also established by the same Executive Decree to improve the effectiveness of enforcing existing laws governing shore use, mangrove forest protection, water pollution, near-shore fisheries, and mariculture. The Ranger Corps

draws together local level governmental administrative and enforcement officers. Today there are UCV units in seven locations along the mainland coast, each of which is led by a port captain of the General Direction of the Merchant Marine of the Ecuadorian Navy (known locally as DIGMER). This is Ecuador's equivalent of a Coast Guard.

PMRC program activities in the ZEMs and the work of the National Coastal Resource Management Commission were brought to a halt for nearly three years in the transition from USAID funding to a program administered by the Government of Ecuador and funded by an IDB loan. From 1996-2001 the PMRC program focused on implementation of ZEM plans and other actions in the national strategy on the priority issues of the five environmental issues identified earlier. A second IDB loan to support coastal management in the order of \$14 million is currently being negotiated and is expected to be disbursed in early 2004. In the transition to a new IDB loan there was another halt of activities of the coastal management program.

The PMRC program has been based on approaches of public participation and partnerships. The Ranger Corps are composed of groups with members from various organizations. Members typically include the Forestry Agency, Subsecretary of Fisheries, Ecuadorian Tourism Corporation, and DIGMER.

The National Fisheries Institute (Instituto Nacional de Pesca, or INP) is an important organization in marine fisheries and has been a partner with the PMRC. For example, INP documented baseline conditions in critical artisanal fisheries—the shrimp postlarvae fishery and the fishery for adult egg-bearing female shrimp upon which many shrimp hatcheries depends. As a result of this research the INP added an extension component to their work and collaborated closely with fishers to gather catch data and identify options for conserving marine resources.

Other organizations that have been closely involved in coastal and marine affairs include Fundación Pedro Vicente Maldonado, the Subsecretary of Coastal Environmental Management in the Ministry of Environment, the Coastal Polytechnic University (ESPOL), and the recently inaugurated International Center of Research on the El Niño Phenomenon (CIIFEN) in Guayaquil.

CIIFEN is a center that draws together scientific information on El Niño and its impacts, and plays a coordination role with regional and national partners in research and extension. CIIFEN is forming a national technical committee that include three Ecuadorian Universities and the Naval Oceanographic Institute (Instituto Oceanográfico de la Armada, or INOCAR). Climate change has a major social and economic impact on Ecuador's coastal and marine zone and, therefore, there is a great need for better information systems and adaptive technologies. Currently, a major gap in the CIIFEN program is extension capability.

The offices of the Coastal Resource Management Program are located in Guayaquil, as are most of the other organizations mentioned so far. It is important to note that there is another group of organizations that is primarily located in the nation's capital in Quito with a primary orientation of biodiversity conservation in critical conservation areas and protected area management. This group includes the Nature Conservancy, World Wide Fund for Nature (WWF), Conservation International, and the Universidad San Francisco de Quito. To date, the biodiversity conservation organizations in Quito and the coastal and marine management organizations in Guayaquil have not coordinated efforts to a large degree. One integrating mechanism is the National Biodiversity Working Group organized by IUCN, but it does not have a marine focus.

In terms of marine systems, the predominant focus of the Quito organizations is directed at the Galapagos Islands. Ninety-seven percent of the Galapagos are within a national park and the province has a unique administrative structure. Because of this, and because of the distance and cost of operating in the Islands, the PMRC has not integrated the Galapagos into its activities.

Institutions of Higher Education

The University with the most advanced academic and research programs in coastal and marine topics is the Coastal Polytechnic University (Escuela Superior Politécnica del Litoral, or ESPOL). ESPOL was founded in 1958 as a polytechnic institution with the basic goal of improving the use of natural resource and technological development of the country. The university is based in Guayaquil and has several campuses. The main campus is located in a rural setting outside of Guayaquil. Another campus is located in the Santa Elena Peninsula west of Guayaquil in Guayas Province. ESPOL is a public university but the national government supports only about 51 percent of the budget with the rest generated by outside support. The university has about 9,000 students, offers forty-five undergraduate and graduate degrees, and has about thirty Ph.D. level professors.

One of the oldest colleges of ESPOL is the College of Marine Engineering and Marine Sciences, which offers five major degree programs: Naval Engineering, Oceanography, Tourism, Biology and Aquaculture. The College has about 500 students and twenty-two professors. Master degrees (M.Sc.) are offered in three areas: Coastal Resources Management, Marine Aquaculture, and Port Management.

The College of Marine Engineering and Marine Sciences has three associated centers—National Coastal Resources Center (CENAREC), National Aquaculture and Marine Research Center (CENAIM), and the Fisheries Oceanography Research Center (CIOP).

CENAIM is an aquaculture research center with an international reputation for excellence. It is a partnership of the State, private sector and ESPOL. The objective of the Center is to promote the sustainable development of aquaculture productivity and diversification in Ecuador through scientific research, technology development, training and outreach. The research facilities of CENAIM are located in San Pedro de Manglaralto. The facilities include twenty laboratories, experimental tanks, a specialized library, offices, and living quarters and food services. The Center has 65 staff, of which fourteen have Ph.D.s or M.Sc. degrees.

The focus of CENAIM is primarily scientific research but has interest in expanding into more extension services if funding could be secured. CENAIM currently provides extension to small mariculture farms in Pedernales. There is also interest in working in El Oro Province to provide extension services to small farmers.

The National Coastal Resources Center (CENAREC) was created by ESPOL to partner with and provide training to technical staff of the Coastal Resources Management Program (PMRC). The Center has hosted four two-week training courses in ICM with participants from throughout Latin America. The Center is currently involved in extension activities that include working with coastal communities in biodiversity management, mangrove and river basin management in Guayas Province, and strengthening environmental management capacity of the municipalities.

The Fisheries Oceanography Research Center (CIOP) was created in December 2002 by the College of Marine Engineering and Marine Sciences to provide science and technology services and to develop research in support of fishing operations and fisheries development. CIOP has funding from the fishing industry, the National Science and Technology Foundation, and international donors. Current research projects are the development of atlases of the eastern Pacific pelagic fisheries and development of fishing charts to improve the efficiency of the tuna fishing fleet.

ESPOL has a partnership with a consortium of Belgian Universities. Phase one of the partnership extended from 1999-2002 and carried with it \$3.2 million of external financial support. A second phase that will extend from 2003-2008 will be funded at a similar level. The overall objective is to enhance academic program excellence through innovations in education in parallel with institutional capacity building in the administration and execution of applied scientific research. One of four components targets environmental management of agriculture and aquaculture. Research areas include coastal impacts of pesticide use in the banana sector, irrigation and agriculture studies in the Santa Elena peninsula, monitoring of benthic communities and natural populations of shrimp, and an alert system for shrimp epidemiology.

ESPOL has a Center for coordination of scientific research—the Scientific and Technological Research Center (CICYT). CICYT establishes priorities for research through its Research Council, provides logistic services to projects and researchers, offers training in how to conduct research for graduate students and faculty, and is responsible for communications.

There are many other private and public universities located both on the coast and in Quito with studies in areas associated with the development and sustainable use of coastal and marine resources:

- Catholic University of Ecuador (Pontificia Universidad Católica del Ecuador) has academic programs in five locations with two in coastal areas—Esmeraldas and Manabí. The Manabí program has facilities in the communities of Portoviejo, Chone y Bahía and offers academic programs in marine biology and sustainable tourism
- Universidad San Francisco de Quito (USFQ) is a private, liberal arts university in Quito. It has grown rapidly since it was founded in 1988 and now has 3,500 undergraduates, forty-five majors, and eleven Master's programs, including Environmental Management. It hosts an Institute of Applied Ecology that has an emphasis on marine conservation. Last year, USFQ opened a new campus on the island of San Cristóbal, Galapagos Islands. This campus will offer an intensive semester program for international and national students in areas of marine biology; two-year Associate degrees in natural resource management and tourism management; and, graduate programs in marine biology, conservation, and protected areas management will be developed. USFQ also has field extension projects on the Galapagos Islands and on the mainland coast in Punta Galera and Machalilla National Park near Plata Island. In the Galapagos they are focusing on capacity building of fishers in the marine reserve and doing baseline research on tourism on Isabela Island. In Machalilla they are working on development of a marine reserve, and in Punta Galera they are working to improve the information base.
- Catholic University of Guayaquil (La Universidad Católica de Santiago de Guayaquil) is located in Guayaquil. It is a private, non-profit institution with more than 5,500 students enrolled in degree programs.

- The University of Guayaquil was founded in 1867. It has a student body of some 60,000, offers thirty-one degrees and has campuses in six other locations along the coast and on the Galapagos Islands. The College of Natural Sciences offers degrees in biology and environmental engineering, among others, with studies in conservation, mangrove rehabilitation, and environmental impact analysis.
- The Naval Oceanographic Institute (INOCAR) carries out oceanographic research on issues of national interest related to the sea and coastal zones
- Technical University of Machala

Opportunities for Program Development

There was universal agreement among participants at the national Roundtable that the concept of the NSGCP has value for Ecuador. The group found the following aspects of the NSGCP concept particularly appealing:

Long term planning, continuity, and national commitment. Currently, there is a lack of vision and an agenda for the coast. The NSGCP would promote the development of a national agenda and strategic plan for the management of the coastal and marine zone, and provide a structure for creating and improving national and municipal policies. It would also create conditions favorable for institutional collaboration and generation of leveraged funding. Currently, there is a lack of a vision and agenda for the coast.

Integration of research, education and extension. The application of the NSGCP would accelerate the development of extension services, currently an area of weakness. Extension services and carefully targeted applied research are clearly needed to provide technical backup to a great diversity of coastal resource users along the coast. The connection of education and research with extension would ensure that information is available to those who need it and overall public awareness and education would be improved.

Neutrality and independence. The independence of NSGCP encourages objectivity and decreases the swings in direction that result from political shifts. Program independence and decentralized operation are critical for continuity of effort.

Quality control. The NSGCP has a clear and transparent process, mechanisms of quality control, peer review, and periodic evaluation.

Discussions on how to structure a program like the NSGCP in Ecuador centered on a network of institutions with a lead university responsible for administration. The strongest candidate lead institution is the Coastal Polytechnic University (ESPOL). ESPOL has the greatest depth of academic and research programs in fields of coastal and marine science. Faculty and university leaders at all levels up to University President confirmed support for a coastal and marine program like NSGCP, including in-kind financial support. The Scientific and Technological Research Center at ESPOL could be the administrative home for a new program of coastal and marine research and extension since it already provides leadership and support for science and technology to the university.

Although the lead institution would be responsible for program administration, Roundtable and other in-country discussions emphasized that the program should be designed as a network

involving multiple institutions, as is the NSGCP. The program would thus be a mechanism to direct research and extension services on priority themes across professionals from many different institutions. In the NSGCP, organizations outside of the administering university may submit proposals for competitive and non-competitive grants. While all grants are not open competition, all proposals undergo peer review.

Some of the key institutions identified as important members of a national network on coastal and marine issues include ESPOL, National Fisheries Institute (INP), The Nature Conservancy, Conservation International, Universidad San Francisco de Quito, National Oceanic Institute (INOCAR), Ministry of Environment, Pontificia Universidad Católica del Ecuador, University of Guayaquil, PMRC, US Peace Corps, and International Center for the Study of El Niño (CIIFEN).

Based on the Roundtable discussion and review of the current priorities of existing institutions, candidate applied research and extension themes for an Ecuador program modeled after NSGCP include:

- Conservation hotspots and marine protected areas
- Sustainable mariculture and promotion of alternative species
- Enhanced management of artisanal fisheries
- Integrated coastal watershed management
- Climate change adaptation
- Zoning and shorefront use
- Social and economic causes and consequences of deforestation
- Public education
- Sustainable tourism

Given the prevalence of poverty, a program focus on actions that have positive economic impacts would be important. In the actual development of a program, detailed guidelines for thematic areas would be developed by the program Director with the assistance of the national network of program partners.

Funding for a new program will be a challenge. New and innovative financial mechanisms are required in order to ensure this is a long-term and continuous program. An annual allocation from the government of Ecuador may not be a realistic option. By contrast, a one-time government grant to establish an endowment might be possible. For example, the government of Ecuador made a \$7 million grant to CENAIM. It is being managed as a trust fund with interest supporting part of CENAIM's costs of operation.

5. GULF OF FONSECA CASE STUDY

Coastal and Marine Issues

The marine environment of the Gulf of Fonseca is shared by Nicaragua, Honduras, and El Salvador. The Gulf is a shallow depression with an area of approximately 3,200 square kilometers, and a coastal length of 261 kilometers of which 185 kilometers are in Honduras, forty-seven kilometers are in Nicaragua, and twenty-nine kilometers are in El Salvador and (Sherman and Tang, 1999). It is estimated that there are over one million people living near the Gulf, with some 600,000 in Honduras, 240,000 in Nicaragua, and 160,000 in El Salvador (Varela, 2002). Most of these people are dependent on the Gulf's natural resources for

subsistence and livelihood. Resource dependent activities include shrimp post-larvae collection, artisanal fishing, mangrove harvest for structural wood and fuel, and small-scale agriculture.

The three countries surrounding the Gulf are some of the poorest in Latin America. Nicaragua and Honduras are the second and third poorest countries in Latin America with an average annual income of \$430 and \$730 per year, respectively. Unemployment is high around the Gulf, probably exceeding 40 percent. The situation is worse in parts of Nicaragua where it is estimated that over 60 percent of the population living near the Estero Real are unemployed. Out-migration from the region is high, but the overall birth rate is high as well. Those that remain in the area are usually women and children. Unemployment, low income, high birth rate, and poor social infrastructure make the majority of people living in the Gulf highly vulnerable.

According to the majority of the individuals that we met with, the most significant constraints to environmental and social stability in the Gulf of Fonseca are poverty and the lack of alternative economic opportunities.

The Gulf of Fonseca is an area of internationally recognized natural value. Due to its extensive wetlands, mangrove ecosystems and importance for migratory waterfowl the entire area around the Gulf has been placed on the RAMSAR list of Wetlands of International Importance. It is estimated that the coastal zone contains over seventy species of migratory birds, fifty species of fish, twenty-two mammals and reptiles, and a vast variety of plants and trees (Varela, 2002). One of the most distinct ecological features of this region is the extensive mangrove ecosystem. The area contains some 22 percent of total mangrove area of the Pacific coasts of Central America (Guatemala to Panama) (Sherman and Tang, 1999). This mangrove system traps nutrients and sediments, stabilizes the coastline, and is a breeding ground for commercially important fish, mollusks, and crustaceans. The wetlands, consisting of mangrove forests, creeks, tidal flats, and seasonal lagoons, comprise nearly 33 percent of the total area of 163,000 hectares of plains and coastal areas around the Gulf (Vergne et al, 1993).

The estuaries and salt flats bordering the Gulf are ideal for shrimp farming. Farmed shrimp exports are one of the top foreign exchange earners for Nicaragua and Honduras. Last year, Honduras exported about \$84 million in farmed shrimp making it the second largest export sector in Honduras after coffee. Shrimp farming is not a significant industry in El Salvador, although shrimp post-larvae facilities are an important part of the economy in the area around La Union.

Nicaragua currently has over 9,000 hectares of shrimp ponds in production and it is estimated that the industry generates over 16,000 jobs. It is estimated that another 20,000 people receive direct and indirect benefits from shrimp farming (Saborio, 2001). Private producers operate approximately 4,000 hectares and about 5,000 hectares are operated by 130 shrimp cooperatives. Of the latter, ninety cooperatives have joined together to form four unions, which in turn have joined to form a single federation. The goal of the federation is to increase market power and access to credit. The private industry is represented by the National Association of Aquaculture Producers (ANDA).

Until Hurricane Mitch, Honduras had approximately 18,500 hectares in shrimp production—currently there are about 12,500 hectares in production. The farms that remained idle post-Hurricane Mitch are mostly small and medium operations. Unlike Nicaragua, the shrimp farm industry in Honduras is primarily private. The National Aquaculture Association of Honduras (ANDAH) was formed to collectively organize the industry and give it a unified voice. ANDAH

actively promotes good management practices and provides a forum for decision making on issues affecting the industry.

There is little government oversight of the shrimp aquaculture industry in Nicaragua and Honduras. Poor siting and production practices, and over development of the industry can degrade the coastal environment and damage the natural resource base that the industry depends on. The main environmental concern associated with shrimp farming in the Gulf is conversion of mangrove and other habitat and associated conflicts with artisanal fishers. Although most of the industry in Honduras was initially sited on salt flats, individuals wanting to enter the industry but without access to suitable land often convert mangroves into ponds. Estimates of mangrove loss in southern Honduras due to shrimp pond construction range between 2,100 and 4,300 hectares (Collinson, 1997).

Upstream deforestation is a critical problem confronting the marine and coastal environment of the Gulf of Fonseca. Upland deforestation, inadequate erosion prevention measures, agriculture, and the damming of major rivers (such as the Nacaome in Honduras) are the primary causes of changes to microclimate, desertification in the region, deposition of sediment loads in the Gulf, eutrophication, and reduced freshwater flow to the Gulf (Vergne et al., 1993). Deforestation reduces watersheds' ability to naturally regulate water runoff and stabilize soils. As population in the region increases and soil stability decreases, natural disasters such as hurricanes, drought, and earthquakes produce more severe consequences for the population of over one million in the Gulf.

Some 76 percent of the total freshwater input to the Gulf is from Honduras (Vergne et al., 1993). The major Honduran rivers are the Choluteca and Nacaome Rivers. At this time there are few governance mechanisms that link upstream and downstream users in the major watersheds. The Choluteca River originates near Tegucigalpa and passes through areas of high population density and human activity. The river transports chemicals, pesticides, heavy metals, fertilizers, and human waste. Large tracts of dry, tropical forest in the Choluteca River watershed have been cut for fuel, construction material, and to make way for hillside agriculture and grazing. Some 74 percent of the watershed is deforested (De Ferranti, 2000). Similarly, some 70 percent of the Nacaome River watershed has been deforested. As forests are cut or burned for farming and livestock subsistence on the steep slopes soil erosion increases and the land quickly becomes unproductive, forcing people to move yet again to clear more forests. These human-induced impacts compound natural variations in climate, which tend toward seasonal drought in the winter months. In some cases, perennial streams no longer flow during the dry season.

The Estero Real in Nicaragua is also an important source of freshwater flow to the Gulf and carries increasing sediment loads and nutrients (US Embassy, Managua, 2003). In El Salvador, almost all of the original primary forests surrounding the Gulf have been cleared for agriculture and cattle production.

Other issues in the Gulf of Fonseca include uncertain territorial boundaries and overlapping legal jurisdictions. This condition has made it difficult for nations and ministries to regulate the harvest and trade of marine and coastal resources, such as shrimp post-larvae, fish, mollusks, and mangrove wood. Most of these resources fall under one or more systems of state *de jure* control, but in practice rules governing these extensive harvest practices are difficult to enforce due to these uncertain sovereign boundaries and legal jurisdiction among different government agencies.

Finally, commercial shipping may become an issue in the future. There is a proposal to construct a dry canal linking the Pacific port of Cutuco in the Gulf of Fonseca near the town of La Union, El Salvador with an Atlantic port in Honduras. A Japanese-led consortium has offered a \$121 million dollar loan to the government of El Salvador for the construction of the new port. The port would accommodate two to three ships weekly carrying over 4,500 containers per ship. Containers would be transported from Cutuco by train or truck to the Atlantic coast of Honduras, providing a new means of access to the Atlantic from the Pacific.

Environmental concerns include the impact of dredging and the potential of oil spills. It is projected that over 1.2 billion tons of soil will be dredged in the Gulf to create the necessary shipping lanes. How this would affect living marine organisms and water circulation dynamics in the Gulf has not yet been studied. Oil spill disaster response plans would also need to be developed. As a shallow depression the Gulf is highly vulnerable to oil spills, especially during the dry season when currents tend to flow inward toward the coastal areas of the Gulf. The consequences of a single oil spill could be disastrous for mangrove systems, the shrimp farm industry, and fishers.

Efforts to Address Coastal and Marine Issues

Two of the largest ongoing projects in the Gulf region dealing with coastal and marine issues are PROARCA and PROGOLFO, funded by the U.S. Agency for International Development (USAID) and the Danish Development Agency (DANIDA), respectively.

PROARCA is a Central American environmental project executed by the World Wide Fund for Nature (WWF), The Rainforest Alliance, and The Nature Conservancy (TNC). The project is now in its second phase and 7th year with a level of funding equal to about \$1 million per year. The project works closely with the governments of member countries and key actors to develop norms, policies, and land use plans governing the management of protected areas within the framework of the Mesoamerican Biological Corridor. PROARCA has a Regional Technical Advisor for the Gulf based in Tegucigalpa, Honduras. PROARCA-COSTAS, involves very localized cases of coastal management in Belize, Honduras, Nicaragua and Panama.

PROGOLFO has four main objectives: 1) increase production, 2) develop income generating activities, 3) environmental improvement of the Gulf, and 4) improvement of social well-being through sexual education and population growth. Decentralized management and community empowerment are strategies of the project. For example, the project seeks to improve community access to government ministries, strengthen local capacity to protect the areas that have been designated as RAMSAR sites, and works with an Association of Municipalities of the Gulf of Fonseca.

Key Weaknesses in the Gulf

Lack of real and effective coordination among the countries

Lack of long-term programs, continuity and follow-up

Lack of integrative mechanisms between investigation, extension and education

Lack of information and awareness on marine and coastal issues

Lack of political will

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The regional environmental and development coordinating body is the Central American Commission on Environment and Development (CCAD). CCAD is responsible for coordinating

regional environmental activities and establishing policy frameworks within which actors in the Gulf can cooperate. CCAD is nested within the Central American Integration System (SICA) created in 1991 through an international treaty known as the Tegucigalpa Protocol. SICA is an umbrella organization designed to facilitate economic, environmental, political, and social integration throughout the seven Central American countries.

Another regional body that is involved with fisheries policy and research is the Central American Organization of the Fisheries and Aquaculture Sectors (OSPESCA), which is a part of CCAD. Currently, the Director of OSPESCA is also the Director of the Fisheries Department for the government of El Salvador.

Work on coastal and marine issues in Nicaragua include those of the Center for Aquatic Ecosystems Research (CIDEA) at the University of Central America in Managua. CIDEA works closely with marine and coastal resource users, with a specialization in research, training and extension in mariculture. Non-governmental actors also play an important role in the development of coastal communities. The Center to Promote Research of Rural and Social Development in Managua focuses on alternative technologies, marketing and trade, and social infrastructure such as education, electrification, and clean water. Its programs are directed at improving household well being and providing assistance to small producers, including shrimp farmers.

In both Nicaragua and Honduras, municipalities are playing an increasingly important role in environmental management and economic development of the Gulf region. In the Gulf region of Nicaragua, five municipalities, backed by a social consortium of shrimp farmers, agriculturists, and mangrove harvesters, have generated a joint proposal to establish a social and environmental program, focused on improved production, employment generation, restoration of the Gulf environment, and education of natural resource users. In Honduras, an association of seven Gulf municipalities has formed to work on issues of common concern, especially water quality and quantity.

In Honduras, the Committee for the Defense and Development of the Flora and Fauna of the Gulf of Fonseca (CODDEFAGOLF) is an NGO in Honduras with wide visibility and international recognition for its work in environmental outreach in the Gulf.

The University of Zamorano located near Tegucigalpa has many locally and externally funded efforts related to the coastal and marine environment of the Gulf. Zamorano provides technical assistance in agriculture, aquaculture, forestry and rural development. Its program of tilapia aquaculture research and extension has had a significant impact on the growth of farmed tilapia in the country.

Most Important Attributes of Past Project Success in the Gulf

Flexibility in implementation

Wide consultation

Strong extension component

Good communication

Roundtable Summary Report, Tegucigalpa, October 21-22, 2003

PROMANGLE is a community-based forestry project with external donor support operating out of the Honduras Forestry Department within the Agriculture Ministry. PROMANGLE has a staff of fifteen, including five extension agents that work with community volunteers to replant mangrove swamps cleared by small independent shrimp farmers operating in protected areas without permits. PROMANGLE manages thirteen plots, where they have two years of data measuring growth rates, stocking density, and other environmental parameters. PROMANGLE

also helps to develop community woodlots using fast-growing species to take pressure off mangrove harvest for fuel and for construction. The program maintains and operates a research facility near San Lorenzo, including GIS capabilities and a seedling nursery, which provides a base for mangrove extension activities.

The Food and Agriculture Organization (FAO) has formed a multi-sectoral committee in Honduras with the purpose of sharing information and coordinating efforts at stabilization in dry upland areas along the Pacific coast. The FAO initiative provides baseline information and data, such as spatial information on food insecurity, food production, and public health.

There are many NGO's in El Salvador with development activities in the Gulf region focused on coastal and marine themes. The Maquilishuat Foundation is an NGO in El Salvador that focuses on social development in poor rural and urban areas, including regions bordering the Gulf. It directs activities in training, technical assistance, natural resource conservation, and community relations. FUNDAMUNI is an NGO that is currently focused on watershed management in the Gulf with support from USAID. ADESGOLFO is another NGO that works with municipalities to develop ordinances to protect marine resources and improve solid waste management. They are currently working with 80 communities. Finally, the Consortium of Sustainable Development coordinates activities with many organizations around the Gulf on economic development issues.

Institutions of Higher Education

The U.S. National Sea Grant Program and the University of Puerto Rico Sea Grant Program worked with two universities in Honduras and Nicaragua as part of the U.S. supported Hurricane Mitch recovery program. The University of Central America (UCA), Managua and the University of Zamorano were selected as partners in an extension program targeting the shrimp farm industry. A Technical Assessment Team led by the University of Puerto Rico surveyed a number of institutions and ultimately identified these two universities as the strongest institutions in terms of being able to provide technical assistance, outreach, and training.

There are seven primary universities in Honduras. In addition to the University of Zamorano, they are Centro Universitario Regional del Litoral Atlántico (CURLA), Universidad Nacional de Honduras (UNAH), Universidad Nacional Agraria (UNA), Universidad Católica, Escuela Nacional de Ciencia Forestal, Universidad de San Pedro, Universidad Tecnología, and the Universidad José Cecilio de Valle. None of these universities have marine and coastal resource programs. Marine biology is taught at UNA, and aquaculture courses are offered at UNAH, UNA and Zamorano. Zamorano and CURLA are the only institutions with research and extension programs in Honduras.

In addition to UCA, the main universities in Nicaragua are Universidad Autónoma de Nicaragua (UNAN), UNAN León which is not affiliated with the Managua campus, Universidad Nacional Agraria (UNA), Universidad de Ingeniería (UNI) and the Universidad Americana de Managua (UAM). Among these, UCA and UAM are private universities. UNI has an environmental science program but does not necessarily have any programs focused on marine or coastal related topics. At this time, UCA is the only institution conducting research and extension related to the marine and coastal environment of Nicaragua.

Below, we review UCA and the University of Zamorano. Our assessment is based on questions drawn from several guides on institutional capacity assessment (WWF's *Organizational Assessment Guide*, TNC's *Institutional Training Assessment*, and the Coastal Resource

Center's *Organizational Capacity Assessment: Assessing Institutional Development of a Marine Center within a University*). The questions were grouped around three broad categories: internal capacity including vision, mission, strategies, governance structure, financial resources, programmatic initiatives, and linkages with other actors in public, private, and civil society.

University of Zamorano

Zamorano (also known as the Pan American School of Agriculture) is a private, international technical college established in Honduras in 1941. Zamorano's mission is to prepare leaders for the Americas in sustainable agriculture, agribusiness, natural resources management, agro-industry, and rural development. Its broader vision is to transform the rural populations of Latin America into globally sustainable and competitive sectors. A Sustainable Development and Competitiveness Strategy was adopted in 2002 with a focus on competitiveness, environmental responsibility, and international industry standards.

Zamorano is unique in that all students and faculty live on campus. Infrastructure includes dormitories for students, administrative offices, classrooms, 72 staff residencies, guest housing and conference facilities, library; dining facilities, clinic, laundry, barbershop, bookstore, bank, churches, recreational facilities, workshops, sawmill, etc. There are 663 employees with 201 in administrative positions, 124 faculty and medical staff, and 328 maintenance and clerical positions. Total land area is 5,495 hectares with a large portion under forest cover or used for agricultural production.

The University is recognized throughout Latin America for its academic programs in agriculture, sustainable rural development and natural resources management. Zamorano trains thousands of farmers, extension agents, technicians, educators, policy makers, and researchers each year, usually in the context of rural development projects that integrate good science with technology transfer. Many leaders in government in Honduras and other countries throughout Latin America are Zamorano graduates. As a result, Zamorano is often called on to provide information on important environmental and social issues that may influence decision-making.

One of the key attributes of Zamorano is that academic programs bridge the gap between theory and practice. Classroom education is linked with fieldwork and learning by doing 'real-world' environment and development issues. Coursework, research, and extension is offered in aquaculture (especially tilapia farming). Other academic disciplines that are indirectly related to the use of the Gulf's marine and coastal resources are agriculture, forestry, and watershed management. Human activities in the upper watersheds create significant impacts upon downstream marine and coastal resource user groups and the coastal environment as a whole.

Zamorano actively builds partnerships with other institutions to tackle critical development challenges and advance its interests while achieving a common vision or strategy based upon the needs and interests of its user constituencies and partners. The University maintains programmatic and strategic relations with multilateral donor organizations, NGOs, civil society organizations, other universities and

Characteristics of the University of Zamorano

- Classroom education systematically linked with learning-by-doing, extension, and applied research
- Strategic and long-term planning
- Experience in methods of project administration
- Financial stability through successful fund-raising and business operations
- Project development based on the needs and interests of user constituencies
- Strong relationships with government, private sector and other institutions in the country and Central America.

research institutions, the private sector, government agencies, and the media. The Dean of Outreach and the Director of Outreach are specifically responsible for maintaining these types of external relationships. Many are expressed in the form of Memorandums of Understanding (MOU).

The projects and academic programs of the University are strategic, based upon the development of medium- and long-term goals and priorities for research, education, and extension in close collaboration with resource users. Once objectives are established and individual projects identified with funds obligated, work plans are developed. The work plan for each project identifies the individuals responsible for particular areas of work, the tasks, the process, and the timing. Each of the projects has specific, measurable objectives and indicators designed for internal purposes as well as for funding organizations. An evaluation and monitoring unit has been established to determine whether or not projects and programs are achieving their intended objectives. The unit monitors project objectives and results through a variety of techniques, and provides a process to identify project modifications to improve implementation. Good practices and lessons learned are made available to managers and staff within other units and departments. Other types of reporting are a function of the reporting requirements established by the client or donor agency. Strategic planning, clear allocation of responsibilities and strict monitoring and evaluation processes contribute to organizational stability and accountability.

The University of Zamorano is one of the best funded and stable universities in Latin America. The university has an endowment of some \$42 million. In most years, the Board of Trustees has decided to reinvest most of the interest rather than use it to help finance Zamorano's operating budget. Some of the interest is used to support scholarships for Honduran students and environmental activities in Honduras.

Forty-three percent of Zamorano's income comes from tuition and fund raising for student financial aid. In the past three years Zamorano has raised over \$6 million from donors to establish scholarship endowments dedicated to providing full or partial needs-based scholarships to students. Approximately 35 percent of university income is generated from seven vertically integrated production and service enterprises (primarily agriculture and food service enterprises). Zamorano also has joint ventures with the private sector in areas such as sugar cane production, seed processing, vegetable production for export, poultry production and coffee processing. Additional income comes from grants from various overseas organizations for research, extension, and training.

The Board of Trustees, the International Board of Advisors, and a Development Committee are active in fundraising. All trustees make personal contributions to Zamorano, and many of them facilitate the interaction of the overseas institution with U.S. and international philanthropists, foundations and donor agencies.

University of Central America, Center for Aquatic Ecosystems Research

The University of Central America (UCA) of Managua was created in 1961 as part of the Jesuit University worldwide network. The main mission of the University is to focus on human and socio-economic development in Nicaragua. Currently, the University holds 114 full time professors and 275 part time professors. There are around 6,500 enrolled students in five departments. UCA's mission is to contribute to the equitable and sustainable human development of Nicaragua and the region through high quality teaching, research and social outreach, inspired by Christian values.

The Department of Science and Technology for the Environment (S&T) has 264 students. Currently, the department has several majors including fisheries engineering and aquaculture. The Department also has several research centers and among them is the Center for Aquatic Ecosystems Research (CIDEA), the focus of this section.

CIDEA was created in 1996 through an act passed by the University's Board of Directors. This act provides CIDEA with the authority to function as an independent unit within the university but provides no direct funding to CIDEA. The Director of CIDEA reports to the Dean of S&T who reports to the President of the University. An informal CIDEA Board of Directors was established by the Director of CIDEA and this Board acts as an ad hoc advisory committee. This Board includes the Chairman/President of the University's Board, the President of UCA, the General Secretary/Provost of UCA, Financial Director of UCA, and the Dean of S&T. CIDEA's decision-making authority resides with the Director as long as the Board of Directors approves.

The Center's original mission was focused upon the sustainable development of the aquaculture industry in Nicaragua with a specific focus on increasing productivity while reducing environmental impacts. In the year 2000, the Center adopted a program of research, education, and extension with assistance from the University of Puerto Rico Sea Grant.

CIDEA's first strategic plan is currently being reviewed by the Board of Directors. In the strategic plan, CIDEA has chosen to broaden its scope and begin focusing on wider marine and coastal issues. The center is interested in expanding its activities to areas such as marine fishing and agriculture in the Gulf region of Nicaragua. To date, the fisheries sector has received very little support in terms of technical assistance or training. CIDEA is working toward conducting more constituent driven research and broadening its extension activities to solve local problems on the Pacific coast of Nicaragua as well as in the Gulf of Fonseca. The center is also working toward developing better linkages with the university's facilities on the Caribbean coast and would eventually like to place an extension agent in Bluefields and/or Puerto Cabeza.

The Center employs twenty-three people, of whom sixteen are technicians and professionals, who teach, conduct research, hold workshops, and provide training and technical assistance. Physical infrastructure includes an office and laboratories in Managua and a training facility in Puerto Morazan, Department of Chinandega near the Gulf. The training facility can hold thirty people and has dorms that can accommodate twenty-four people. CIDEA has also acquired a facility in San Carlos on Lake Nicaragua that can be used for training. Other equipment includes four vehicles, a tractor, and two small boats with outboard engines.

UCA contributes infrastructure, utilities, maintenance, computer services and teaching salaries, but projects executed by CIDEA are fully funded by external resources. The Center has raised an average of \$341,200 per year. During the period from 1996-2000 CIDEA funding was primarily dependent upon the Japanese International Cooperation Agency (JICA). Currently, CIDEA's sources of funding are diversified. CIDEA works with and has relationships with a wide variety of international and national NGOs, private industry, national and local government, external donors and multilateral organizations, and other Nicaraguan universities. An agreement with the university ensures CIDEA funding for one year if CIDEA is unable to raise sufficient funds to cover operational costs or staff salaries. CIDEA has not yet had to rely on this agreement but has had difficulty covering short-term operating costs at various times.

Administration of projects includes development of work plans, definition of staff responsibilities, and identification of specific, measurable, and relevant outcome indicators. CIDEA would like for

all project and programmatic activities to align with its strategic plan. The project coordinator and relevant team members meet with the Director to discuss where the projects are in the process and whether or not the intended outcomes have been completed. CIDEA makes an effort to share and discuss the status of projects with its staff and clients, determine the lessons learned, and identify the challenges that remain. As a result, the planning and implementation process is modified to adapt to changing circumstances.

Primary research areas include water quality research of the Estero Real, a major source of freshwater to the Gulf; nutrition and pathology of shrimp; and shrimp production efficiency. The results of research are disseminated through a variety of mechanisms including workshops, training programs, environmental education programs, and direct technical assistance. The Center's education and training component is designed to extend information and research results to students, local user constituencies, and professionals. Since 2000, CIDEA has convened sixty-seven training workshops: eleven for students, thirty-seven for the cooperatives of shrimp producers and nineteen to professionals working in the field. These workshops have covered U.S. Seafood Safety and Handling Standards/HACCP compliance, shrimp nutrition and pathology, shrimp farm bio-security, pond management, improved water quality, quality and protection of the environment in relation to aquaculture, protection and conservation of the mangrove ecosystem, management of solid waste, and credit and business management.

Research and technical assistance are closely linked. Technical assistance has traditionally focused on the needs of small shrimp producers and farmer cooperatives in regions with high poverty levels. Areas of research and technical assistance focus on water quality, the conditions of the shrimp larvae, sample populations of shrimp larvae, pathology, nutrition follow-ups, pond management, densities and harvesting techniques, and handling and the management of the product. Since 2000, sixteen cooperatives and more than 100 members have received technical assistance from CIDEA. CIDEA operates a 30-minute radio program providing advice to producers throughout the region on aquatic and related environmental issues, technologies, and best management practices.

The Center has established strong relationships with the shrimp farm industry through the process of extension. Meetings are periodically held with the presidents of the four shrimp cooperative unions, comprised of more than 150 cooperatives. At these meetings CIDEA staff identify problems and needs and develop strategies for research, technical assistance, and training.

CIDEA also develops relationships with local municipal offices, schools, and health centers in the communities where its activities take place to ensure that its activities are aligned with development needs and goals or to take on new areas of assistance. For example, CIDEA assisted with the development of Nicaragua's development strategy for the municipality of Puerto Morazan by engaging institutions and NGOs operating in the region and identifying common goals and objectives. The majority of the Center's projects are identified through the process of extension or by working directly with user constituencies to identify their needs. CIDEA also provides services to national government bodies. For example, CIDEA currently has an agreement to conduct research for the Ministry of Industry, Finance, and Commerce.

Opportunities for Program Development

We found widespread interest in the concept of the NSGCP, as well as agreement that the model would be beneficial and feasible for application to the Gulf. Important principles of

implementation for such a program in the Gulf highlighted at the Roundtable discussions held in October 2003 included:

- Flexibility in implementation and administrative agility
- Formal integration into the structure of the lead University
- Wide consultation and strong feedback loops between program activities and resource user groups
- Transparency in decision making and information sharing
- Partnerships and cooperation across the region and across government, private, NGO, University and community groups
- Neutrality and high standards excellence

High priority topics that stood out at the Roundtable that would be candidates for applied research and extension themes for the Gulf include:

- Improved shrimp mariculture practices and promotion of alternative forms of mariculture
- Problems with microbiological water quality
- High sedimentation levels
- Loss of mangroves and disappearance of dry forest
- Fisheries overexploitation and destructive practices
- Biodiversity inventory and restoration of critical ecological systems
- Public education and environmental awareness

Specific mechanisms for implementation of a program in the Gulf and key steps to begin the process were also identified at the Roundtable and through individual consultations. A university-led, but decentralized regional program involving alliances between universities, government agencies, NGOs, internationally funded projects and communities is envisaged. A key objective of a program focused upon the Gulf of Fonseca would be to pool resources and efforts, furthering the capacity of higher education institutions in marine and coastal research, education and extension.

Benefits of a Regional Coastal and Marine Program

- Create common objectives while maintaining independence
- Provide an impartial vision between the community, government, and different actors
- Develop relationships between countries and organizations to share information and workplans
- Permanence and continuity

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In addition to a University administrative body, Roundtable participants noted that the governance structure for a program in the Gulf should include a Scientific Committee to oversee peer review of proposals. Other critical program groups include regional Committees that would provide the mechanisms for regional coherence, planning, and institutional connectivity and cooperation.

Based on our comprehensive capacity assessment of the University of Zamorano, this institution ranks high in terms of possessing the experience and institutional features required to successfully administer a program modeled after the NSGCP. Zamorano is probably in the best position to act as a central administrative body to a regional program due to its experience,

capacity and resources to mobilize efforts in research, extension, and education in the region. As a regional program, we would envisage other Universities in Nicaragua and El Salvador also playing important programmatic roles with the lead university. Some form of associate university programs with Country Program Coordinators identified at each associate university might be appropriate for a Gulf of Fonseca regional program. Our review of institutional and academic capacity suggests that the strongest candidates for associate university programs would be UCA/CIDEA and the University of El Salvador.

Sea Grant was considered an idea program to support the sustainable development of the region because it includes aspects that are likely to produce success. It would also allow for more economic opportunities for an ecologically vulnerable area. Lastly, it would allow for the exchange of information and the exchange of action plans.

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Extension was highlighted at the Roundtable as particularly important to a long-term coastal and marine program in the Gulf. Public support for extension is limited in Nicaragua, Honduras and El Salvador. The same benefits of extension in the United States would apply to the Gulf. For example, extension agents develop trust and social capital with communities over time and understand local issues and problems. They provide feedback from users to researchers regarding the efficacy of applied technologies and information as well as the shortfalls and remaining needs.

Key steps to begin the process of program development were identified at the Roundtable. They include selection of the lead university for program administration, development of detailed program proposal, formal program incorporation within the university, formation of national and regional program support groups, definition of program priorities, consultation with government ministries, and fund raising.

6. CONCLUSIONS

This paper has looked at the overall coastal and marine context of the LAC region, made a case for the benefits of applying the NSGCP model to the LAC region, and explored opportunities in two specific locations: Ecuador and the Gulf of Fonseca. Our long-term vision is the successful establishment of many country programs modeled after the NSGCP in Latin America and the Caribbean, generating an operational South-South and North-South network of information sharing and learning across both LAC programs and U.S. Sea Grant College programs. Both the concept and execution of such a network would be novel and we believe would provide unprecedented opportunities to advance sustainable coastal and marine development. This type of program would catalyze greater public spending on education, science and technology, and extension to resource users—critical to increase productivity of coastal and marine sectors and to find innovative solutions to problems.

In both Ecuador and the Gulf of Fonseca the need for and advantages of programs modeled after the NSGCP ring clearly. The Roundtable discussions and other consultations have identified initial thematic priorities and important partners working on coastal and marine issues. We conclude that University capacity exists in both Ecuador and the three countries of the Gulf of Fonseca to execute long-term coastal and marine programs.

In both locations, we see a strong interest in using a new program like NSGCP to pool resources and build a network of interested parties who will increase collaboration on coastal

and marine issues. We also find that extension services are relatively weak in both locations and should be emphasized relative to applied research.

Program focus in both the Gulf of Fonseca and Ecuador would need to be tailored to the reality of overwhelming poverty and economic vulnerability. This means promoting new and innovative technologies and extending knowledge to enhance income and employment in the coastal and marine sectors while being conscious of social and environmental problems. It also means developing programs in recognition of important environment and poverty linkages. For example, poverty reduction is usually enhanced by an increase in the proportion of educational resources going to primary education and to the poorest groups and regions (Lipton, et al., 1998). Women's education, in particular, affects nearly every dimension of development, from lowering fertility rates to raising productivity and improving environmental management (World Bank, 1996). Investments in public health services, nutrition, safe drinking water, and improved sewage disposal also contribute to poverty reduction.

Elements of a governance structure include a university administrative unit with Program Director and staff. A Scientific Technical Committee or similar structure would be required to oversee review of competitive and non-competitive grant proposals. Sea Grant College Programs in the United States might be able to help with peer reviews. In the United States, extension work is not necessarily based on competitive grants, but there is always peer review. An Advisory Committee would be needed to help guide program direction and find linkages across collaborating partners and issues. An Advisory Board may also be needed to provide oversight to the Program Director and assist in areas such as external relations and fund raising. More detailed thoughts on a potential institutional design are developed in Annex 2.

Program start up will be the most difficult and critical phase. The development of institutional arrangements and detailed program guidance will take time. Therefore, it would be beneficial to work with a collaborative partner in the U.S. with knowledge of NSGCP and experience in coastal and marine resource management. A study tour to the United States to visit and learn from Sea Grant programs and the National Sea Grant Office would also be invaluable.

Securing sources of funding for programs is a major challenge because we cannot necessarily expect central government support as in the United States. Each program will need to be financially entrepreneurial. Once a national commitment to a program like NSGCP is demonstrated and some of the guidelines and governance structures are in place, we feel that a proactive program will be in a good position to attract external support from international donor organizations. National government policy commitments will also be critical to attract international support and to ensure that the programs are integrated into long-term national strategies.

7. NEXT STEPS

Based on this paper and Background Paper 1, a proposal for action will be developed and circulated to key partners and donor institutions. The proposal, background papers and Roundtable reports will be circulated at the White Water to Blue Water Conference, March 21-26, 2004 in Miami, Florida where representatives from twenty-six nations from the wider Caribbean region and a host of regional and international organizations, Universities, government and non-government organizations will be present. Sessions will be held at the Conference on transferring the NSGCP model to the LAC region.

Refinement of the proposal will continue after the March 2004 Conference in collaboration with NOAA and other U.S. partners, country partners, and funding organizations. Finally, directed discussions among interested partners on funding and implementation mechanisms will occur at a special Symposium that is planned for September 2004.

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ANNEX 1

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A Network of Centers of Applied Research, Extension and Education for Coastal Ecosystems in Latin America and the Caribbean

***A Concept Paper
March 2004***

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Executive Summary

Background Papers 1 and 2 were compiled during a year and a half of extensive consultations, meetings and roundtables with partners from Nicaragua, Honduras and Ecuador. This phase of the Sea Grant International program has provided an extensive foundation of research and analysis by which to assess the feasibility of adapting the Sea Grant model to an international context. From this experience we propose to establish a university-based network in Latin America and the Caribbean (LAC) that integrates activities in extension, public education and applied research to address the issues posed by the accelerating decline of the region's coastal and marine ecosystems. This decline of coastal ecosystems has major implications for the health, livelihoods and quality of life in the LAC region. At stake are some of the planet's areas of highest biodiversity and ecosystem processes that affect the functioning of the planet as a whole.

We propose to address the root causes of these issues by establishing a **LAC Regional Network of University-based Centers for Applied Research, Extension and Education for Coastal Ecosystems**. The objective of the network is to strengthen the capacity and abilities of institutions in the LAC region to understand the current and future problems of coastal ecosystems, and to sustain south-south and north-south collaborative learning by promoting the diffusion of best practices in coastal activities and learning-based governance at geographic scales that range from, for example, a neighborhood wetland to its watershed and adjoining large marine ecosystem. The network's investments in research, education and extension will be tied directly to the central mission of making the principles and good practices of stewardship an operational reality across the region. The network will promote the societal values and behaviors that support both the sustainable development and the sustainable conservation of coastal and marine ecosystems.

The US NOAA-Sea Grant Model

The US Sea Grant College Program (Miloy, 1983) provides a mature and successful model for building capacity at the local, regional and national levels to practice marine and coastal stewardship in a wide diversity of geopolitical settings. The Sea Grant model calls for investing simultaneously in education, research and extension to address expressions of social and environmental change that are identified as important to local stakeholders. The program has been successful in identifying topics of concern to the nation as a whole, and then nesting its activities into long-term programming so that programs address topics in a way that resonates in a given locale, while building knowledge for use by the network as a whole. Sea Grant programs periodically revise their priorities by developing strategic and implementation plans, by assessing and evaluating investments, and by identifying best management practices for national dissemination.

The Sea Grant College Program operates on a simple premise: apply the intellect of universities and research institutions to the problems and opportunities associated with the use of coastal ecosystems. Four universities were selected as the initial members of a national network. Today, the network sustains programs in thirty universities with activities in over 300 affiliated universities that together involve several thousand researchers, educators, extension professionals and students (<http://www.nsgo.seagrant.org>). In contrast to conventional university-based academic research, Sea Grant institutions are committed to making investments that allow researchers, educators, students and extension agents in the field to work towards collaborative solutions to problems of great social concern.

Much of Sea Grant's strength lies with its local, grass roots approach. Each of the thirty participating universities or university networks has a staff of extension agents and educators that address the needs of their communities and their associated ecosystems. Sea Grant's dedication to local service is supported by strong regional and national networks. A successful program that is developed in one community may be shared and modified for use in another community thousands of miles away. The national Sea Grant network has formed ten national "theme teams" to address issues of national importance that have closely related manifestations at the state and local levels (http://www.nsgo.seagrant.org/SG_Themes/sq_theme_areas.html). Thematic focus areas gather the intellectual resources from throughout the national network, sharing information and ideas, and acting as a well-informed voice for the responsible stewardship of coastal ecosystems.

The National Sea Grant College Program is administered by the National Oceanic and Atmospheric Administration (NOAA) in the Department of Commerce. It is supported by approximately US\$ 62 million per year in federal funds that are distributed to member universities in coastal states. The National Sea Grant Office in NOAA provides administrative and programmatic support in the form of developing national program initiatives, federal budget requests, program monitoring and evaluation, and communicating program activities to other NOAA and federal offices.

The basic structure of the Sea Grant federal-state funding partnership is based on the time-tested paradigm of American "Land Grant Colleges"—a group of agricultural colleges who pioneered agricultural innovations resulting from applied research that was coupled with the transfer of science-based knowledge to farmers and other users through public education and extension services.

The Sea Grant structure is designed to allow for significant autonomy at the state level. Most programs are administered by a single university; a few programs are structured as consortiums. Each program maintains an administrative office, which manages the research, education, extension, and communication activities, and distributes funds on an annual or biannual basis to a wide range of institutions (i.e., it is not limited to participants at the host university) through a competitive grants process. Programs provide state university resources as matching funds to those disbursed by NOAA.

The National Sea Grant Review Panel is part of the original legislative structure of the Sea Grant program. The fifteen appointed members of the panel advise on overall program policy, comment on strategic directions, act as a direct liaison to cabinet level individuals, and conduct regular four-year assessment reviews of each state Sea Grant Program.

The Sea Grant Association is a non-profit organization comprised of a representative from each Sea Grant institution. The association provides the mechanism for state and national programs to coordinate their activities, to set priorities at both the regional and national level, and to provide a unified voice for these institutions on issues of importance to oceans and coasts. All state programs have Advisory Boards or Councils that provide programmatic advice and counsel. These advisory structures are composed of a wide variety of stakeholders and play a pivotal role in identifying priority coastal and marine issues and actions that the Sea Grant programs can take to address those issues.

The focus of individual Sea Grant College Programs must be both consistent with the overall vision and direction of the NOAA National Sea Grant Program, and attuned to the environmental, social and economic priorities and problems at the state level. State programs

are designed to respond in a timely fashion to locally identified education, research and extension needs. This simultaneous “top-down” and “bottom-up” approach provides for both focused long-term strategies for impacting national-level marine and coastal priorities, while allowing each program to tackle important local issues.

There is a strong desire both in the U.S. Sea Grant program national office and in its member universities to engage in collaborative activities directed at the coastal issues internationally. At the University of Rhode Island (URI), the Coastal Resources Center (CRC) has been working for nearly two decades in the LAC and other regions to help establish effective coastal governance programs. For years, CRC has advocated for long-term investments in building institutions that will advance more effective governance in coastal and marine ecosystems. In 2003, the URI Sea Grant Program joined with CRC and NOAA/Oceanic and Atmospheric Research International Activities Office in a collaborative effort to assess the feasibility of establishing a program modeled on the U.S. Sea Grant program in the LAC. This effort has been funded in part by the U.S State Department’s Ocean, Environment and Science Program. The objectives of this effort are:

- To propose a structure of a university-based, LAC-designed program based upon the Sea Grant model to address priority coastal and marine development and conservation issues.
- To evaluate how the proposed structure and implementing mechanisms would be applied to universities in two pilot sites in the region: these are the tri-national Gulf of Fonseca region on the west coast of Central America, and the mainland coast of Ecuador.
- To discuss the resulting adaptations of the U.S. Sea Grant model with participants at the White Water to Blue Water Conference to be held in Miami in March of 2004, and at subsequent meetings involving participants from the region, the U.S. Sea Grant College Program, and potential donors.
- To explore how the U.S. Sea Grant College Program would partner with a similar network in the LAC region to promote collaborate activities and support the adaptation of a model to different socio-cultural settings.
- To identify potential sources of funding for a regional network and strategies for organizing a first generation of activities with participating universities in the region.

The first phase of this initiative was structured around the preparation of two background papers. The first describes the defining features of the U.S. Sea Grant College Program and reviews past experiences with the application of Sea Grant-like activities and programs in other countries. The second background paper assesses trends and the priority governance issues in marine and coastal ecosystems in the region, and then explores the feasibility of adapting the Sea Grant model to universities in the two pilot sites. This concept paper draws from the background documents and a sequence of meetings at the two sites. It proposes the goals, operational principles and structure for a Sea Grant-like network in the LAC region.

Regional Trends in Coastal and Marine Ecosystems

For human populations, sustainability means transforming our ways of living to maximize the chances that environmental and social conditions will indefinitely support human security, well being and health. (*McMichael, Butler and Folke, 2003*)

In the past twenty years, the nations of the LAC region have seen profound social and economic change. In most countries, a political democratization process has opened up new opportunities for public participation, inflation has declined, foreign investment increased, and

free market reforms have led to the privatization of state enterprises. The average annual growth rate of Gross Domestic Product (GDP) per capita was positive between 1989 and 1998 in all but four LAC countries. Yet the region is still characterized by a highly unequal distribution of wealth and the gap between incomes is widening. Real wages have fallen and unemployment is now higher than in 1990 (UNEP, 2000). Poverty and political disturbances increased in 2003. Social tension has reached the stage whereby some Latin American cities and rural areas have the highest rates of crime and violence in the world. These past two decades have brought about profound changes in the structures and functioning of the LAC regional economies:

- Services (including tourism and financial services) have increased in importance. Tourism now accounts for about 12 percent of GDP in the LAC region, one-quarter of foreign exchange earnings, and provides one-fifth of all jobs. Most of this is beach tourism.
- The pressure on exportable natural resources continues to be enormous. The volume of exports from sectors with a recognized environmental impact—fishery, forestry, agriculture, and mining sectors—have increased over the past two decades (ECLAC, 2002).
- The region continues to be more reliant on primary commodities and raw material exports than other parts of the world with similar income levels.

The LAC region contains 60,000 kilometers of coastline. Only two of its nations are landlocked. The coastlines and nearshore waters contain a rich diversity of ecosystem types ranging from the swampy estuaries in the tropics, to desert landscapes, upwellings of extraordinary fertility and the fjord-like coasts of the south. Yet the trends in the condition of these ecosystems are similar. The Inter-American Development Bank (IDB) (1998) describes them as follows:

- Declining coastal water quality from land-based sources
- Impoverishment of coastal communities
- Depletion of commercial fisheries stocks
- Mounting land use and resource allocation conflicts in the coastal zone
- Increased risks associated with coastal erosion, flooding and shoreline instability

Population pressure, livelihood needs and land scarcity mean that the traditional effects of primary activities, particularly changes in land use, are now being concentrated in smaller, more fragile areas that are more sensitive vulnerable to human forces. In many cases, landless people have settled in flood-prone coastal areas because those are the only lands available to them. In those instances, unsustainable use of coastal areas and resources may appear to be the only alternative short of migration to the cities. The plight of the rural poor encourages migration to cities. Today, 76 percent of the region's population is urban (World Bank, 2003) and 60 of the region's largest seventy-seven cities are coastal (Hinrichsen, 1998). Urban development is frequently rapid, spontaneous and disorganized, leading to uncontrolled growth and the transformation of natural areas of great ecological value (e.g. deltas and estuaries, mangrove wetlands, coastal lagoons). Despite this growth of coastal urban population, the total rural population has not declined, meaning that the degree of population pressure on natural resources is unlikely to subside.

Deforestation is the main cause of biodiversity loss in the region and multiple problems affecting natural resources, especially water and soils. Of the 418 million hectares of natural forest lost worldwide over the past thirty years, more than 40 percent was in Latin America (Armstrong and Brandriss, 2003). The resulting increase in erosion in watersheds leads to accelerated sedimentation rates in reservoirs and marine ecosystems. Degradation usually starts in the upper watersheds but the sedimentation, other effluents, and changes to fresh water flows greatly influence coastal and marine ecosystems, damaging coral reefs and other living marine resources.

About one-third of the region's reef areas are considered at high risk due to sedimentation caused by deforestation, runoff of nutrients from sewage and agriculture, and destructive fishing practices (Burke et al., 2000). Mangrove deforestation is especially damaging to the productivity of near-shore areas as well as to shoreline flooding. Mangrove habitat is one of the LAC region's high value ecosystems. Almost 40 percent of the more than 17 million hectares of mangrove swamp that exist in the world are within the LAC region, and 8 of that 40 percent is found in Central America.

All countries face difficult problems caused by the overexploitation and poor management of inshore fisheries (Christy, 1997). Inshore fisheries, which are the most severely over-exploited, employ the largest number of fishers. Here habitat degradation is most severe. In the region as a whole, fishing fleets are far larger than marine ecosystems can sustain. Aquaculture, especially shrimp and tilapia aquaculture, has grown rapidly, but efforts to make operations compatible ecologically and socially have taken a back seat to economic concerns. There is an urgent need to develop ecologically sustainable, socially compatible aquaculture in the LAC and elsewhere (Costa-Pierce, 2002, 2003).

Institutional Responses

Within this context of an eroding resource base, mounting conflicts and, along most coastlines, great poverty, governments and international donors have worked over the past two decades to improve the effectiveness of coastal and marine resource management. Much larger investments are being made to build the physical infrastructure that can support improved livelihoods and societal well-being. The United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992 and a series of subsequent global conventions have advocated integrating approaches to governance. This has prompted experiments with collaborative inter-agency approaches to environmental issues. The importance of involving the affected public and private sector interests is now widely recognized. Today there is a wealth of examples of how good practices for specific activities have been developed and applied. Investments in training and in institution building have produced a level of capability and experience that contrasts sharply to the conditions that existed two decades ago. However, budget deficits and the need to generate resources to meet external debt obligations have resulted in budget cuts, to which environment-related areas are extremely vulnerable.

International donors and the development banks have sponsored projects designed to improve coastal and marine governance. The cumulative total of investments in since 1990 in issue analysis, research, planning, capacity building and public education in support of better coastal and marine resources management and more sustainable forms of coastal development and conservation is well over one hundred million dollars. The IDB, for example, estimates that it invested not less than US\$ 60 million in coastal management between 1993 and 1996 (Olsen and Christy, 2000). These funds are provided in the form of "projects," rarely of more

than five years in duration, that funnel several millions of dollars into efforts that are justified as contributing to “sustainable development.” The designs of these projects typically call for demonstrable improvements in environmental quality, societal well-being, or both. The anticipated outcomes or more effective governance usually fall far short of expectations.

The magnitude of international project funds is typically far larger than nationally sponsored public sector investments in the target place or the topic. The result is that the energies of local institutions and a growing community of capable professionals is redirected from one short-term project to another as the availability of funds and the interests of individual donors dictate. The interests of the donor agencies are shaped by shifts in global priorities and changing perceptions of both priorities and the effectiveness of competing strategies for achieving stated goals. For example, in the 1990s, much of the effort to better the management of natural resources in the region has been in support of biodiversity conservation—largely through the designation of protected areas in which human activity is prohibited or kept to a minimum. The retooling of use patterns towards less destructive and unsustainable activity has been a secondary priority. A decade later, the emphasis is switching to poverty alleviation. Countries that have invested great efforts in re-organizing governmental institutions with responsibilities for environmental issues suddenly find that the international support—if not demands for such reforms—are evaporating. Finally, the organizations that now are present and are addressing coastal and marine governance issues operate in isolation from one another. There is much re-inventing of the wheel. While ecosystem governance requires the sustained pursuit of unambiguous goals, few coastal and marine management initiatives persist for more than a decade, and subsequent efforts sponsored by other donors are rarely linked to earlier investments or benefit from what could have been learned from previous efforts.

The Proposal to Establish a Regional Network of University-based Centers for Applied Research, Extension and Education for Coastal Ecosystems.

An Alternative Approach

A Sea Grant-like network in the LAC region would offer a well-timed alternative for addressing the fundamental issues that impede effective and sustained progress on marine and coastal governance. First, the program would not be designed as a short-term project, but a long-term program. It would invest in stable universities with a demonstrated commitment and capacities in linking among the three pillars of the diffusion of innovation model (research, education and extension), as this has been refined through university-based Land Grant and Sea Grant programs. The LAC region would be designed to benefit from the experience and support of the U.S. Sea Grant program through “sister institution” arrangements and other mechanisms designed to access the institutional arrangements, procedures and experiences that have proved most important to the success of the U.S program. The collaborative research efforts and exchanges among personnel will all be important to collaboration between the two networks.

One of the most critical features of this proposal is the imperative of a long-term commitment matched by high standards of accountability and applied research excellence. History is marked by the success of bold and innovative responses to complex challenges that at first appear overwhelmingly difficult but prove vulnerable to intelligent and tenacious attack. Sustained struggle against disease and illiteracy, the diffusion of democratic forms of government, and transformations in agriculture have modified the behavior and the beliefs of entire societies. But such change has required investment and purposeful action that has been sustained over many decades and the application of the best knowledge and human talents to

well-defined issues. Progress accumulates when efforts are intelligently directed at defined problems and when advances capture the imagination of segments of society. New initiatives build upon a foundation of sustained experimentation, self-evaluation and adaptations to new insights and new challenges. Equally important to success is open communication and exchanges that are governed by common rules that are self-imposed.

An Emphasis on Extension and Applied Research

Building on the experience of the Land Grant and Sea Grant programs, the network would recognize that societal change in response to complex forces is best instigated by programs that integrate among research, extension, and education. The U.S. programs have made their priority research. In the Land Grant system this resulted in the development and refinement of technologies related to food production that have revolutionized American agriculture. However, the major issues to be addressed in order to achieve the more effective governance of coastal and marine ecosystems cannot be addressed only through the application of technology. Ecosystem stewardship and sustainable forms of development require fundamental shifts in societal values and behavior. Much is already known about the nature and consequences of ecosystem misuse and overuse and “technological fixes” that make significant contributions to long-term solutions that are available. The major gap lies in the successful diffusion of such knowledge, skills and attitudes among the societies and subgroups involved.

Many universities in the LAC region already contain sophisticated research capabilities and outstanding educational programs. The weak link lies in diffusion. The term “extension,” perhaps because it is linked to the technical aspects of agriculture, does not elicit a positive response with many LAC audiences. This may also be why Sea Grant programs in the U.S. have adopted the term “outreach.” Some Latin American universities use the term “*proyeccion*.” Whatever the term, the network would recognize that much is known about how to avoid or reduce unsustainable patterns of resource use and ecosystem change. The process of building relationships of trust and mutual respect between those with the necessary knowledge and skills with those whose behavior needs to change by working through “community organizers” and identified “change agents” requires a high degree of professionalism and sustained effort. In this process it is essential to establish the dialogue required to tailor a practice to the needs of a specific place or audience.

Such abilities are often weak or absent in most Latin American universities. This contributes to the inefficiency with which such knowledge diffuses with society. The network will therefore emphasize activities designed to promote the transfer of the concepts, tools and practices that promote ecosystem stewardship at a range of scales. The network’s investments in public education and research will be directed at supporting this emphasis upon the integration within society of socially and environmentally sustainable practices in the use and the governance of coastal and marine ecosystems.

The Principles of Service for Regional Network of University-based Centers of Applied Research, Extension and Education for Coastal Ecosystems

As an international network dedicated to advancing the knowledge and practices required for the inter-generational stewardship of coastal and marine ecosystems, it will have the following defining characteristics:

Addressing Urgent Ecosystem Governance Issues. The network will develop medium- and long-term goal priorities for integrated activities in research, education and extension in collaboration with coastal stakeholders. Resources will be channeled to the most salient social, economic, and environmental issues raised by change in coastal and marine ecosystems and

coastal societies. While the network as a whole will address a short list of priority themes, each Center and its affiliates will develop activities that respond to expressions of those issues of concern to stakeholders in their geographic area.

Continuity Through Long Term Investment. Once they have been formally designated as members of the network, each **Center for Applied Research, Extension and Education of Coastal Ecosystems** will be assured a core of long-term financial support. Such sustained support, however, will be subject to periodic re-certifications. Long-term commitment is essential to building a community of coastal managers, policy experts, educators, researchers and private sector partners dedicated to resolving the issues of coastal and marine development and conservation. This permanence also makes implementing a long-term strategic plan possible.

Catalyzing Strengthened Institutional Capacity. Rather than create new institutions, the network will mobilize and sustain long-term connections with existing institutions with commitment and capacity to tackle coastal and marine challenges.

Striving for Excellence and Accountability. The network will operate under a formal system of checks and balances with rules that allocate responsibility among the foundation, individual Centers, affiliated institutions, and individual researchers and extension agents. The system will be constructed through strategic planning, competition, and a rigorous peer review process. Funding will be reduced or withdrawn from programs and individuals that do not meet standards of professional excellence in management, education, research and extension. A defining feature of the network will be that excellence is judged primarily against the relevance of the activity to the priority coastal and marine issues addressed by the network as a whole.

Promoting Nested Systems of Applied Research, Education and Extension. In an increasingly interdependent and interconnected world the objectives and processes of governance must be structured as a nested system that links the neighborhood wetland to the municipality, the province, the watershed and seaward, to the adjoining Large Marine Ecosystem (LME). The successful practice of ecosystem governance requires agility in moving up and down these scales. Both the regional network and the programs based at each Center will promote extension, public education and research that address a variety of scales and promotes understanding for the interconnections of each.

Establishing the Network

The first step in establishing a regional LAC network is to secure the commitment of an initial group of like-minded universities of recognized stature. Winning international support for the network will require that the institutions demonstrate their interest and commitment to the same principles of service.

How Many Institutions Should Participate and What are the Criteria for Their Selection?

The U.S. began with four universities selected on the basis of their demonstrated capabilities in activities that link research to extension and education. In all cases the selected universities drew upon their experience as Land Grant universities. They could all demonstrate that the making of these connections was already a feature of their culture. Such traditions are not as strong in universities with expertise on coastal and marine topics in the LAC region, although there are some notable exceptions. Beginning with approximately four universities and not a larger number would simplify the process of making the principles of service operational,

and establishing the network as an effective and high quality alternative path by which effective coastal and marine governance can be advanced.

Initial priorities for the participating universities will be to select the themes upon which they propose to focus their efforts and to negotiate an agreement with the U.S. Sea Grant program for how collaborative relationships would be structured and sustained. With these fundamentals in place, potential investors in the program would be approached. It will be important, however, to establish that the ownership, and long-term commitment to the program, lies within the participating universities in the LAC region. The universities themselves would make **not less than a 25 percent financial contribution** to the core funding of their node in the network.

Potential Focal Themes for the Network

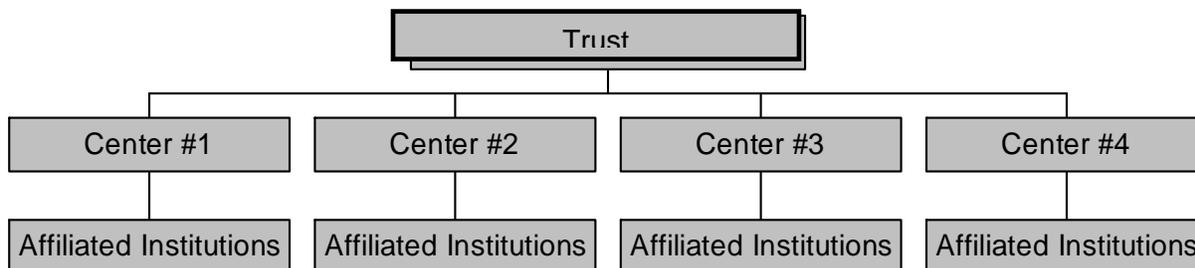
The network will focus its activities upon such strategically important themes as:

- Poverty reduction in natural resource dependent coastal communities
- The development of nested systems of governance that unite planning and decision making at the local level to planning and decision making at the scales of watersheds and large marine ecosystems
- Changes to the distribution of the quantity, quality and pulsing of freshwater flows in coastal ecosystems
- Sustainable forms of fisheries and aquaculture
- The conservation and rehabilitation of critically important habitats such as estuaries, coastal wetlands and coral reefs

By making sustained investments on these topics and promoting collaborative learning across the network, the network will advance the societal values and behaviors that support both the sustainable development and the sustainable conservation of coastal and marine ecosystems. All investments will be directly tied to the central mission of making the principles and good practices of ecosystem stewardship an operational reality.

Program Structure

The network will be structured as a three-tiered system. An **International Trust headed by an executive director** and funded by one or more international institutions will be responsible for the overall operation of the network and will approve triennial work plans that have been vetted by a rigorous system of peer reviews. The network's programs will be designed and implemented by designated Centers hosted by a university in each participating nation or region. Each Center will in turn collaborate with one or more affiliated programs that include other universities, research institutions and NGOs.



Operational Features of the Network

Four issues in the operational design of the network will be especially critical to the long-term success of the network:

1. The design and operation of an administrative structure that provides for checks and balances and distributes power among the members of the network.
2. The securing of significant “match” to funding provided by the Trust to the Centers.
3. The design and administration of the external peer review processes by which all Centers and their work plans are evaluated.
4. Development of methods for soliciting and incorporating the perceptions and the needs of stakeholders when shaping work plans and evaluating the network’s activities.
5. Performance Evaluation

These features, both individually and as a group, are uncommon in the current designs and operations of programs in Latin American universities.

Administrative and Decision-making Structures

Essential to the success of the network is the authority and responsibility vested in the Trust. *The Trust’s principle responsibility will be to defend the Principles of Service.* The Trust will oversee the process of admitting new national and regional nodes to the network and periodically evaluate and re-certify the participating Centers. It will also orchestrate the peer review process to which all proposals for network activities will be subjected, approve triennial work plans and allocate funds among the participating national and regional programs.

The Trust will promote mentoring relationships between each node and selected Sea Grant programs in the U.S. The expectation is that the U.S. Sea Grant Program will make competitive funds available directed specifically at establishing collaborative relationships between Sea Grant Programs and partner institutions in other nations.

A university in each participating nation or region will host each Center. The Centers will be administered by a full time director who will be supported by a small staff. Each Center will develop a five-year strategic plan that will set forth how it intends to respond the priority themes for the network. The activities of each Center will be guided by its Strategic Plan and will include the following:

- Appointment of an Advisory Council to each Center and coordination among other committees that may be established in support of specific Center activities
- Overall financial administration
- Fundraising for activities that support the core mission of the Center and its Strategic Plan
- Administration of grants

- Development of guidance and coordination of the granting process including timing, format of competitive and non-competitive grant proposals, communication of call for pre-proposals and proposals, and organization of peer review panels and processes
- Program communications such as newsletters, reports, and email list servers
- Dissemination of program materials, knowledge management and information sharing through development of program library and maintenance of Internet web pages

The re-certification reviews and the decisions made by the peer review panel on funding allocations for each work plan, which will be available to all members of the network.

Matching funds

Each Center will be structured as a partnership in which the institutions involved are themselves making a significant investment in the program. Such contributions reinforce the sense of local ownership and responsibility for each node in the network. Each node will match Trust funds at a one-to-three ratio whereby every three dollars provided by the Trust is matched by one dollar provided by the Center and its associated institutions. Ideally, these matching funds will be provided from an endowment or the national government. However, funds from other sources may be used so long as it is demonstrated to the satisfaction of the Trust that such funds support the core mission of the program and are administered according to the network's procedures. It will be essential that matching funds are auditable to assure that the same university funds are not used repeatedly to match different projects and that the monetary estimates of time and facilities meet established standards.

Since many of the institutions that are best suited to contribute to the program have little or no core funding, the network will encourage match trading among the institutions participating in a given program. Another option is to formulate a sliding scale that tailors the matching funds requirements for a Center and affiliated institutions to their financial assets.

External peer review

A major goal of the program will be to establish a tradition of rigorous South-to-South peer review among a network of Sea Grant-like practitioners across Latin America. The peer review process is accepted internationally as a keystone of forward progress and quality control in the sciences. It plays a central role in determining what proposals are funded by the Sea Grant programs in the U.S. In Latin America, peer review processes are applied by the most prestigious scientific journals, and in some cases, to the vetting of proposals for scientific research. However, peer reviews are rarely applied to the more applied activities of the kind that would be undertaken by a Sea Grant-like program nor are peer reviews a part of the fabric of the activities selected and funded by international donors, development banks and NGOs. In the latter cases, reviews are made internally by the funding agency or are simply left to the judgment of those responsible for the disbursement of funds.

The partnering of the pilot programs in Latin America with Sea Grant programs in the U.S. is an important means for strengthening the peer review culture in Latin America. It will also be important to encourage exchanges between participating programs in the region. This can go far in promoting collaborative learning and fostering a creative competition among the institutions involved. The current process for developing three-year work plans in the Sea Grant program follows a sequence of steps shown in Box 1. A simplified version will need to be developed for an initial LAC program.

Box 1. The Current Peer Review Process in the Sea Grant Program

- A year before a new funding cycle each Center director, with the advice of the Advisory Committee, will release a Request for Proposals (RFP) that describes the activities it wishes to fund. These activities will stem from the Strategic Plan.
- Interested parties will submit short pre-proposals that respond to the RFP. Once all pre-proposals have been assembled they will be reviewed by an external panel of peers who will work with the director to decide which individuals or teams will be invited to prepare a full proposal.
- Full proposals will be distributed to peers knowledgeable in that field for three to five external mail reviews. A second external panel will meet at the Center to hear short presentations on each proposal, meet with some of the stakeholder groups, and, ideally, view one or more sites where the program wishes to be active. Each external panel will include a member of the Trust whose role is to assure the transparency and professionalism of the process. The panel will make recommendations to the director on what should be funded.
- The Director submits a Letter of Intent (LOI) to the Trust that provides an overview of the activities proposed for the next funding cycle with comments, as appropriate, on its relationship to the Strategic Plan and the recommendations of the external review panel.
- When the Trust signals its concurrence, the director prepares the package of full proposals with text describing how the proposed activities in extension, public education and research relate to one another and contribute to the objectives set forth in the Strategic Plan.
- Approval of the work plan by the Trust triggers the release of funds.

Since linking the extension to research and education will be crucial to success, proposals should combine extension and research or extension and education and avoid separating out extension activities as a distinct program that is separately funded and evaluated.

Issues that Matter to Stakeholders at All Scales

The traditions of consulting with stakeholders to identify the activities to be undertaken by a university-based program and actively involving stakeholders in the evaluation of university-based programs are rarely present in Latin American universities. This is not to say that collaborations between universities and the private sector are weak or absent. The problem is that such involvement tends to be limited to the elites within a society. Too often opinions and needs are rarely solicited from the coastal and marine-dependent people that live in poverty—even though they are the dominant group in terms of both numbers and needs.

Each Center will establish an Advisory Council composed of individuals knowledgeable of the issues and target audiences that the program intends to address in its geographic area. Members of the Council will serve for staggered terms. The Council will not be designed as a decision making body but rather will provide the following functions:

- To advise on the content and the priorities of the Strategic Plan

- To suggest opportunities for potentially fruitful relationships and new issues that the program should consider addressing
- To suggest ways in which the program can have greater impact and improve
- To review and comment upon the triennial RFPs

Individual Center programs will be encouraged to form their own Advisory Committees to play similar roles on a focused topic or geographic area. In some instances, the Center and individual projects, will find it useful to host a public forum to discuss an issue and solicit ideas on how it should be addressed.

Linkages to the U.S. Sea Grant Program

A vital characteristic of the network will be that each Center will be linked to one or more Sea Grant universities in the U.S. Linkages will encourage long-term partnerships and mentoring between like-minded institutions, and encourage the adaptation of practices that have proved effective in the U.S. to the conditions and cultures of the LAC region. Such mentoring will place as much emphasis upon promoting the Principles of Service in the network's operations as it will on the diffusion of practices and technologies specific to the priority themes addressed by the network.

The Anticipated Benefits of the Network

Programs in LAC countries fashioned after the Sea Grant model could become engines for poverty alleviation, sustainable livelihoods and cost savings through the development of new products, innovations, and technologies, as they have in the U.S. Research and extension to reduce the risks of natural disasters in coastal regions hold the potential for saving lives and hundreds of millions of dollars in avoided property damages. Education efforts can enhance the general public's awareness and knowledge in relation to coastal and marine issues.

An important benefit for LAC countries of the Sea Grant model is the continuity of learning on issues of great importance to society across a network of institutions. Coastal and marine projects come and go and are usually conducted in isolation of one another. This reduces their cumulative impact and results in a constant reinventing of the wheel. A long-term program with a Sea Grant-like structure provides a clearinghouse for information and an institutional memory, thereby increasing the effectiveness and efficiency of otherwise isolated coastal and marine initiatives. The program would shift attention towards tangible future scenarios and allow actors to pool resources towards proactive and strategic investments in research, education and extension.

The network structure promotes cross-program and regional cooperation, technology transfer and capacity building. These characteristics are much needed. Latin America is not known for the success of its regional integration initiatives despite a continuous coastline and relative linguistic uniformity. South-south cooperation in coastal management is rare and there is very little experience with LAC networks working toward the improvement of coastal management practices (ECLAC, 1999).³ Some LAC countries have vast experience in certain coastal and marine technologies (such as Chile, in marine culture of salmon), but other

³ A new three-year project funded at the end of 2003 by the AVINA Foundation will create a leaning network directed at leaders in integrated coastal management in Latin America. This project is entitled "A Network of Leaders for Collective Learning and Action to Put the Principles of Sustainable Coastal Development in Practice."

countries cannot currently access this experience. A coastal and marine initiative across LAC countries would not only help to find a specific Latin American management model, but would also contribute to improving the levels of technical training, scientific knowledge, exchange of experiences and south-south cooperation.

In areas where several countries share coastal and marine resources, such as the Gulf of Fonseca, programs could promote harmonization of management efforts, policies, best management practices, and monitoring strategies. Greater coordination and integration of independent management approaches would reduce costs and improve effectiveness. A collaborative forum also enables diverse participants to evaluate effectiveness of programs and projects and to propose adjustments as circumstances change or as new information becomes available.

For the network of U.S. Sea Grant programs, the establishment of similar university-based programs in LAC countries would provide greater opportunities for collaboration, partnering, and establish strong ties through universities in a multiple fashion to strengthen north-south benefits. It would create a vehicle for exchanges of information, collaborative research, curriculum development, education, and extension on coastal and marine issues of shared interest. It may encourage greater national and state spending in the U.S. to partner with countries in LAC.

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Section 2: Interim Progress Reports and Updates

June 2003 Update
September 2003 Update
February 2004 Update
April 2004 Update
Two-Year Progress Report 2002-2004
Capacity Building and Technical Exchange Summary
University Cooperative Agreements and International Activities Summary



NOAA
Sea Grant International
Latin America and Caribbean Program



June 2003 Update and Status Report

NOAA Research's Office of International Activities (IA), in conjunction with the University of Rhode Island Sea Grant and the Coastal Resources Center, has been actively working towards assessing the feasibility of adapting the Sea Grant model of applied research, extension and education to Latin America and the Caribbean. This project complements the U.S. State Department's "White Water to Blue Water" initiative by providing a proven model that allows countries in this region to manage watershed and marine ecosystem based resource issues. The Sea Grant model allows for effective and efficient use of the often-limited resources that are available in developing countries by building a long-term institutional structure that includes constituency driven research, extension, and education efforts. The domestic Sea Grant program consists of thirty programs and over 300 affiliated institutions. The network is eager to expand its scope by working with foreign partners and programs. Currently, Latin American partner universities include the University of Central America in Nicaragua and the University of Zamorano (Pan American School of Agriculture) in Honduras.

The activities associated with this project are being conducted over an eighteen-month timeframe. Progress and accomplishments as of June 2003 are summarized below:

- Interviewed over 60 individuals representing government ministries, universities, non-governmental organizations and private industry in the Gulf of Fonseca region to learn about the social, economic, environmental and political factors affecting marine and coastal resource use and management. Obtained feedback regarding their perspectives concerning the Sea Grant components of research, extension, and education and the potential benefits the model could provide when dealing with marine and coastal resource issues.
- Began assessing existing institutional capacity to address the issues that were identified by the above interviews.
- Received a letter of interest from the Government of El Salvador's Minister of Environment and the Minister of Agriculture expressing their interest in exploring their country's involvement in the regional Gulf of Fonseca Sea Grant project.
- Held a Sea Grant International session at the biennial Sea Grant Week in Galveston, Texas in April. Partners from Honduras, Nicaragua, Indonesia and Korea all presented talks detailing their experience utilizing the Sea Grant paradigm.
- Briefed the Sea Grant College Program's National Review Panel's International Advisory Committee on the status of the Sea Grant activities in Latin America. Updated the Sea Grant Association's Program Mission Committee (SGA/PMC) International Subcommittee on the activities in Latin America and obtained their feedback regarding mechanisms to involve the Sea Grant network.
- Briefed the U.S. State Department and NOAA Office of International Affairs on the Sea Grant International Project and identified ways to further integrate the activities into the "White Water to Blue Water" initiative.
- Continued the preparation and development of two background papers, one of which will provide a review of the existing experience of international research and extension systems and their effectiveness in developing countries while the other will examine the specific economic, political, environmental and social factors in two regions (the Gulf of Fonseca and coastal Ecuador) that will affect how the Sea Grant model needs to be adapted to these local contexts.

Upcoming Sea Grant Latin America activities are summarized below.

Event/Paper/Report	Description	Projected Date
Central America Country Analyses and Partnership Building	Continue to interact with U.S. Embassy, government ministries, universities and stakeholders to gain feedback regarding the Sea Grant program in Honduras, Nicaragua and El Salvador.	June/July 2003
Ecuador Country Analyses and Partnership Building	Meet with U.S. Embassy, government ministries, universities, and a broad range of stakeholders to disseminate information pertaining to the Sea Grant model and gain feedback.	June 2003
1 st Background Paper	Review of the experience of extension, research and education programs in developing countries.	August 31, 2003
Host-Country Roundtables	Share information with in-country partners and gain feedback on proper University institutions to partner with.	By October 31, 2003
2 nd Background Paper	An in-depth look at the social, economic, environmental and political factors affecting the Gulf of Fonseca and coastal Ecuador and the ways in which a Sea Grant program could address these issues.	By December 10, 2003
Widely distribute both Background Papers	In preparation for the Symposium.	December 15, 2003
Domestic Symposium	Discussions of both Background Papers.	January 2004
White Paper	Compilation of the two background papers, Host-country Roundtables and Domestic Symposium.	February 15, 2003
White Water to Blue Water Partnership Building Workshop	Highlight existing partnerships and develop new channels of cooperation in accord with regional network goal.	March 2004
Development of Implementation Plans and Funding mechanisms.	Begin obtaining financial commitments and develop program implementation plans for each country in conjunction with in-country partners.	Ongoing

NOAA Research International Activities and the National Sea Grant Office are both committed to developing beneficial partnerships with a wide range of involved governments, resource management agencies, universities, non-governmental organizations and private industries to ensure that the Sea Grant model is adapted and utilized in the most effective way to address coastal and marine resource issues. IA openly welcomes your feedback, comments and opinions regarding this initiative. Please contact:

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NOAA
Sea Grant International
Latin America and Caribbean Program



September 2003 Update and Status Report

NOAA Research's Office of International Activities (IA), in conjunction with the University of Rhode Island Sea Grant and the Coastal Resources Center, has been actively working towards assessing the feasibility of adapting the Sea Grant model of applied research, extension and education to Latin America and the Caribbean. This project complements the U.S. State Department's "White Water to Blue Water" (WW2BW) initiative by providing a proven model that allows countries in this region to manage watershed and marine ecosystem based resource issues. The Sea Grant model allows for effective and efficient use of the often-limited resources that are available in developing countries by building a long-term institutional structure that includes constituency driven research, extension and education efforts. The domestic Sea Grant program consists of thirty programs and over 300 affiliated institutions. The network is eager to expand its scope by working with foreign partners and programs. Currently, Latin American partner universities include the University of Central America in Nicaragua and the University of Zamorano (Pan American School of Agriculture) in Honduras.

Progress and accomplishments from June to September 2003 are summarized below:

- Interviewed over twelve organizations and thirty individuals representing government ministries, universities, NGO's and private industry in coastal Ecuador to learn about the social, economic, environmental and political factors affecting marine and coastal resource use and management. Obtained feedback regarding their perspectives concerning the Sea Grant components and the potential benefits the model could provide for addressing marine and coastal resource issues. This first phase of issue-assessment and partnership building compliments similar, earlier efforts in Honduras, Nicaragua and El Salvador.
- Completed draft of University of Central America CIDEA institutional assessment. Continued preparation of draft institutional assessment for the University of Zamorano.
- Continued to provide updated information to the Sea Grant Association Program Mission Committee (SGA/PMC) International Subcommittee on the activities in Latin America.
- Continued to dialogue with the U.S. State Department and NOAA's Office of International Affairs on the Sea Grant International Project and identified ways to further integrate the activities into WW2BW's three subcommittee areas (Integrated Watershed Management, Marine Ecosystem Management and Education) as well as mechanisms to promote linkages to the Senior Specialist Fulbright Program.
- Completed first draft and Spanish translation of Background paper #1. (A review of the existing experience of international research and extension systems and their effectiveness in developing countries.)
- Continued work on Background Paper #2 (A review of the specific economic, political, environmental and social factors in the Gulf of Fonseca and coastal Ecuador that will affect how the Sea Grant model needs to be adapted to these local contexts.)
- Initiated preparations for roundtables in Central America (Oct.21-22, 2003) and Ecuador (Oct. 16, 2003). These sessions will serve to bring together a wide range of interests from public, private, university and NGO's to collaborate on what issues Sea Grant could address in the regions and how a potential program could be structured.
- Commenced development of an electronic survey instrument and searchable database to catalogue NOAA Research's products, services, technical expertise and language abilities to highlight the programs, labs and individuals that would be most interested in assisting with international related activities for Sea Grant and WW2BW.

Upcoming Sea Grant Latin America activities are summarized below.

Event/Paper/Report	Description	Projected or completed Date
Central America Country Analyses and Partnership Building	Continue to interact with U.S. Embassy, government ministries, universities and stakeholders to gain feedback regarding the Sea Grant program in Honduras, Nicaragua and El Salvador.	<i>Completed June/July 2003</i>
Ecuador Country Analyses and Partnership Building	Meet with U.S. Embassy, government ministries, universities and a broad range of stakeholders to disseminate information pertaining to the Sea Grant model and gain feedback.	<i>Completed June/August 2003</i>
1 st Background Paper	Review of the experience of extension, research and education programs in developing countries.	<i>First Draft completed August 31, 2003</i>
Host-Country Roundtables	Share information with in-country partners and gain feedback on proper University institutions to partner with.	Ecuador: 10/16/03 Central America: 10/21-22/03
2 nd Background Paper	An in-depth look at the social, economic, environmental and political factors affecting the Gulf of Fonseca and coastal Ecuador and the ways in which a Sea Grant program could address these issues.	By December 10, 2003
Widely distribute both Background Papers	In preparation for the January Symposium.	By December 15, 2003
Symposium	Focused discussions of both Background Papers with experts in the marine and coastal fields.	January 6-8, 2004
White Paper	Compilation of the two background papers, Host-country Roundtables and Domestic Symposium.	February 15, 2003
White Water to Blue Water Partnership Building Workshop	Highlight existing partnerships and develop new channels of cooperation in accord with regional network goal.	March 21-26, 2004
Development of Implementation Plans and Funding mechanisms.	Begin obtaining financial commitments and develop program implementation plans for each country in conjunction with in-country partners.	Ongoing

NOAA Research International Activities and the National Sea Grant Office are both committed to developing beneficial partnerships with a wide range of governments, resource management agencies, universities, non-governmental organizations and private industries to ensure that the Sea Grant model is adapted and utilized in the most effective way to address coastal and marine resource issues. IA openly welcomes your feedback, comments and opinions regarding this initiative. Please contact:

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NOAA Sea Grant International Latin America and Caribbean Program



February 2004 Update and Status Report to PMC International

NOAA Research's Office of International Activities (IA), in partnership with the University of Rhode Island Sea Grant and the Coastal Resources Center, has been actively working towards assessing the feasibility of adapting the Sea Grant model of applied research, extension and education to Latin America and the Caribbean. This project supports the U.S. State Department's "White Water to Blue Water" (WW2BW) initiative by providing a proven model that allows countries in this region to address watershed and marine ecosystem based resource issues. Currently, Latin American partner universities include the University of Central America in Nicaragua, the University of Zamorano (Pan American School of Agriculture) in Honduras, the University of El Salvador and ESPOL in Ecuador.

Progress and accomplishments as of February 2004 are summarized below along with some upcoming events.

- Continued dialogue with the U.S. State Department and NOAA's Office of International Affairs on the Sea Grant International Project to identify ways to further integrate the activities into some of **WW2BW's** thematic areas (Integrated Watershed Management, Marine Ecosystem Management and Education) as well as establish mechanisms to promote linkages to the Senior Specialist Fulbright Program. The WW2BW conference will be held in Miami on March 22-26, 2004.
- Circulated an announcement regarding the **Senior Fulbright Specialist program** to the Sea Grant network and collaborated with USDA to include them in this partnership.
- Completed first draft **Background Paper #1** in English and Spanish. (A review of the existing experience of international research and extension systems and their effectiveness in developing countries.)
- Completed a working draft of **Background Paper #2** in English and Spanish. (A review of the specific economic, political, environmental and social factors in the Gulf of Fonseca and coastal Ecuador that will affect how the Sea Grant model needs to be adapted to these local contexts.)
- Held "**Roundtables**" in Central America (Oct.21-22, 2003) and Ecuador (Oct. 16, 2003). These sessions brought together a wide range of interests from public, private, university and NGO's to collaborate on what issues Sea Grant could address in the regions and how a potential program could be structured. John Jacob from Texas Sea Grant presented on Sea Grant 101 and also provided valuable insight at the Roundtables.
- Commenced development of an electronic survey instrument and searchable **database** to catalogue NOAA Research's products, services, technical and language expertise to highlight the programs, labs and individuals that would be most interested in assisting with international related activities for Sea Grant and WW2BW. This survey will be made available to Sea Grant personnel by late summer 2004.
- NOAA Research International hosted Agnes Saborio Coze the Director of CIDEA (Center for Aquatic Ecosystems Research) at the University of Central America in Nicaragua for three days in February. A **study tour** was conducted with the kind support of Maryland Sea Grant and the NSGO to familiarize Agnes with the administrative structure of Sea Grant.
- Emilio Ochoa (Ecocostas) and Stephen Olsen (CRC) traveled to Honduras, Ecuador and Nicaragua to work with in-country partners in February **to discuss options for administrative structure** and next steps towards implementation.
- Plans are underway to develop a proposal for circulation to international finance institutions, development agencies and other interested organizations to begin implementation of program activities in Honduras, Nicaragua, El Salvador and Ecuador.

Sea Grant Latin America Outlook and Timetable (as of February 23, 2004)		
Event/Paper/Report	Description	Projected or completed Date
Central America Country Analyses and Partnership Building	Continue to interact with U.S. Embassy, government ministries, universities and stakeholders to gain feedback regarding the Sea Grant program in Honduras, Nicaragua and El Salvador.	<i>Completed June/July 2003</i>
Ecuador Country Analyses and Partnership Building	Meet with U.S. Embassy, government ministries, universities and a broad range of stakeholders to disseminate information pertaining to the Sea Grant model and gain feedback.	<i>Completed June/August 2003</i>
1 st Background Paper	The Sea Grant Approach to Coastal and Marine Research, Extension, and Education: A Review of International Experience and Opportunities	<i>First Draft completed August 31, 2003</i>
Host-Country Roundtables	Share information with in-country partners and gain feedback on proper University institutions to partner with.	<i>Completed Ecuador: 10/16/03 Central America: 10/21-22/03</i>
Final Ecuador and Honduras Roundtable Reports Due	Final revisions made to the roundtable reports and final documents prepared in Spanish and English	<i>Completed November 21, 2003</i>
Preliminary Proposal Written	A preliminary proposal based upon the two background papers developed.	<i>Completed December 5, 2003</i>
Partners Meeting in Washington D.C.	Partnership meeting between NOAA, Sea Grant, and URI/CRC to be held in Washington D.C.	<i>Held December 8, 2003</i>
2 nd Background Paper	An in-depth look at the social, economic, environmental and political factors affecting the Gulf of Fonseca and coastal Ecuador and the ways in which a Sea Grant program could address these issues.	<i>Completed December 8, 2003</i>
International Meetings on Sea Grant Latin America	Meetings to be held with NOAA International Affairs, State Department, USAID, etc.	<i>Held December 9, 2003</i>
Widely distribute both Background Papers	Disseminate both background papers in Spanish and English to all partners for review and comment.	<i>Ongoing from December 20, 2003</i>
Completion of 10 – 15 page proposal	10 –15 page proposal/executive summary of the background papers and host-country roundtable discussions.	<i>Ongoing refinement from January 31, 2004</i>
Preparation for WW2BW	Prep for WW2BW	<i>January 1 – March 21, 2004</i>
Dissemination of the 10 – 15 page proposal.	Disseminate the 10 – 15 page proposal to key partners and target individuals for WW2BW.	<i>February 1 – March 21, 2004</i>
White Water to Blue Water Partnership Building Workshop	Highlight existing partnerships and develop new channels of cooperation in accord with regional network goal. Hold breakout session during the Integrated Watershed Management Day, offer Sea Grant 101 course and informally promote the Senior Fulbright Specialist Program/Sea Grant partnership.	<i>March 21-26, 2004</i>
Development of a full proposal.	Working with country partners, U.S. partners, and funding organizations to develop a full proposal.	<i>April 1 – September 1, 2004</i>
Begin Implementation.	On the ground implementation of project activities.	<i>Ongoing</i>

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NOAA
Sea Grant International
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April 2004 Update and Status Report

NOAA Research's Office of International Activities (IA), in partnership with the University of Rhode Island Sea Grant Program and the Coastal Resources Center (CRC), has been actively working towards assessing the feasibility of adapting the Sea Grant model of applied research, extension and education to Latin America and the Caribbean. In March 2004, the White Water to Blue Water (WW2BW) Conference was held in Miami, Florida and brought together more than 600 Caribbean, Latin American and U.S. representatives to learn about existing marine and coastal management efforts in the Wider Caribbean region and develop new innovative partnerships. Sea Grant International program activities support the WW2BW initiative by providing a proven model that allows countries in this region to address watershed and marine ecosystem based resource issues in a long-term, integrated manner. Currently, Latin American partner universities include the University of Central America in Nicaragua, the University of Zamorano (Pan American School of Agriculture) in Honduras, the University of El Salvador and ESPOL in Ecuador.

WW2BW Events and Outcomes

WW2BW was an important event for further adapting the Sea Grant model to the needs of our partners in the LAC region. NOAA Research International Activities coordinated four main activities at the weeklong conference and would like to highlight the contributions of Sea Grant Directors Mac Rawson (GA), Jim Cato (FL), Barry Costa-Pierce (RI) and National Review Panel Member Manny Hernandez-Avila (Puerto Rico) as well as John Jacob (Water Quality Specialist, TX SG).

- A **breakout session** was held as part of the Integrated Watershed Management theme entitled "Adapting the NOAA Sea Grant Model of Linked Research, Extension and Education to the Wider Caribbean Region." IA Director Rene Eppi chaired this session and presentations were given by Barry Costa Pierce and Stephen Olsen (Director, CRC). Extensive feedback was received in the roundtable discussions that were facilitated after the presentations. Interest remains high on the part of Nicaragua, Honduras and El Salvador to adapt the Sea Grant model to their needs and the three universities plan to hold a strategic planning session within the next two months.
- John Jacob and Barry Costa Pierce facilitated a highly informative "**Sea Grant 101**" session as part of the **Institute@WW2BW**. This course explained the basic working components of Sea Grant and presented an interactive skit highlighting the benefits that SG can provide to coastal and marine resource users.
- A "match-making" table was held and attended by more than fifteen individuals representing governments, NGO's and academic institutions from the LAC region on the **Senior Fulbright Specialists Program**. This program was appealing to many from the region as it is an effective tool to develop partnerships with Sea Grant programs and associated personnel that have completed the process to be included on the Senior Fulbright Specialist Program roster.
- A second "match-making" table was held to discuss the ideas put forward in the **concept paper**: "A Network of Centers for the Governance of Coastal Ecosystems in Latin America and the Caribbean." This table was well attended by representatives from a diversity of LAC countries. Many were curious about learning more about the benefits that the Sea Grant model can offer to their particular country.

Priority Next Steps:

Planning, Funding and Implementation

Priority focal areas for partnership in Latin America continue to be the countries of Nicaragua, Honduras, El Salvador and Ecuador. The three Central America partners will hold strategic planning sessions during the next two months and a similar process will be underway in Ecuador by mid-summer. A collective goal for the partnership is to obtain short-term and medium-term support to develop the programmatic and advisory structure of the program and to start initial extension activities by the end of 2004.

Sea Grant Latin America Outlook and Timetable (as of April 2004)		
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NOAA
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Latin America and Caribbean Program



Working to Develop the LAC Sea Grant Program: Two Year Progress Update

For the last two years, NOAA Research Office of International Activities (IA), in partnership with the University of Rhode Island Sea Grant Program and the Coastal Resources Center (CRC), has been actively working towards assessing the feasibility of adapting the Sea Grant model of applied research, extension and education to Latin America and the Caribbean. Currently, Latin American partner universities include the University of Central America in Nicaragua, the University of Zamorano (Pan American School of Agriculture) in Honduras, the University of El Salvador and ESPOL in Ecuador.

Accomplishments since April 2002:

- April 2002: Concept for LAC Sea Grant Network proposed by David Alarid, Central America and Caribbean Regional Environmental Hub Office and NOAA Research International.
- September 2002: OESI Grant Proposal approved by State Department to expand and develop Sea Grant activities in Latin America that were initiated after Hurricane Mitch in 2000 and to develop a regional network.
- December 2002: Established partnership with CRC due to synergy in project interests and international expertise.
- Ongoing since March 2003: Provided periodic briefings for Sea Grant College Program's National Review Panel's International Advisory Committee on the status of the Sea Grant activities in Latin America and updated the Sea Grant Association's Program Mission Committee (SGA/PMC) International Subcommittee quarterly on the activities in Latin America. Obtained feedback regarding mechanisms to involve the Sea Grant network.
- April 2003: Held a Sea Grant International session at the biennial Sea Grant Week in Galveston, Texas in April. Partners from Honduras, Nicaragua, Indonesia and Korea all presented talks detailing their experience utilizing the Sea Grant paradigm.
- July 2003: Commenced development of an electronic survey instrument and searchable database to catalogue NOAA Research's products, services, technical and language expertise to highlight the programs, labs and individuals that would be most interested in assisting with international related activities for Sea Grant and WW2BW. This survey will be made available to Sea Grant personnel by late summer 2004.
- September 2003: Completed University of Central America CIDEA and Zamorano institutional assessments.
- Ongoing since September 2003: Developed partnership with Senior Fulbright Specialist program. Publicized to the Sea Grant network this prestigious program that can support to provide short-term technical courses and trainings to foreign academic institutions that request SG marine or coastal expertise. Began collaborations with USDA to include Land Grant expertise in this partnership.
- October 2003: Convened "Roundtables" in Central America (Oct.21-22, 2003) and Ecuador (Oct. 16, 2003). These sessions brought together a wide range of interests from public, private, university and NGO's to collaborate on what issues Sea Grant could address in the regions and how a potential program could be structured. John Jacob from Texas Sea Grant presented on Sea Grant 101 and also provided valuable insight at the Roundtables.
- January 2004: Completed of two comprehensive background papers: Background Paper #1 provides a review of the existing experience of international research and extension systems and their effectiveness in developing countries while "Background Paper #2" examines the specific economic, political, environmental and social factors in two regions (the Gulf of Fonseca and coastal Ecuador) that will affect how the Sea Grant model needs to be adapted to these local contexts.
- March 2004: Prepared Concept Paper "A Network of Centers for Governance of Coastal Ecosystems in Latin America and the Caribbean."
- March 2004: Participated in the White Water to Blue Water Partnership Initiative Conference in Miami, Florida. Sea Grant International components included a break-out session "Adapting the Sea Grant Model of Linked Research, Extension and Education to the Wider Caribbean Region", a Sea Grant 101 Training Course, and two informational roundtable sessions to highlight the Fulbright Senior Specialist Program and to discuss the draft Concept Paper.

Priority Next Steps: Planning, Funding and Implementation

Priority focal areas for partnership in Latin America continue to be the countries of Nicaragua, Honduras, El Salvador and Ecuador. The three Central America partners will hold strategic planning sessions during the next two months and a similar process will be underway in Ecuador by mid-summer. A collective goal for the partnership is to obtain short-term and medium-term support to develop the programmatic and advisory structure of the program and to start initial extension activities by the end of 2004. Long-term goals include establishing a foundation or endowment to support the long-term efforts of these programs and allow them to move away from short-term planning cycles.

Sea Grant Latin America Outlook and Timetable (as of April 2004)		
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NOAA
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Capacity Building and Technical Exchange Summary

During the last two years, NOAA Research's Office of International Activities (IA) has been working towards assessing the feasibility of adapting the Sea Grant model to the needs of our Latin American partners. One of the most useful ways to share the experiences and lessons-learned from the 30 plus years of domestic Sea Grant program development is to bring the researchers, extension agents and communicators together face-to face with international collaborators. Several technical exchanges and capacity building trainings have been coordinated by IA to help building the important bridges between the domestic network and international programs that hopefully help promote future interactions and collaborations. IA looks forward to facilitating many more directed exchanges and trainings as the international programs continue to develop.

The following is a description of several of the exchanges, trainings and interactions that IA has facilitated as part of the Latin America and Caribbean Sea Grant International program.

Sea Grant Week 2003: This biennial event hosted by the Sea Grant network was an excellent opportunity to bring representatives from the University of Central America, Nicaragua and Zamorano University in Honduras to Galveston, Texas to interact with more than 300 Sea Grant directors, extension agents, communicators, and administrators. Agnes Saborio Coze and Dan Meyer also presented at an international session held concurrently at Sea Grant Week that included presentations from Korea Sea Grant and the Indonesian Sea Partnership Program.

Texas Program Study Tour: Directly following the April 2003 Sea Grant Week, Dan Meyer was hosted by the Texas Sea Grant Program. Texas Sea Grant Director Bob Stickney and his staff organized an intensive three-day schedule of visits with extension agents, aquaculture facilities and the Texas Sea Grant administrative staff for Dan Meyer.

Latin America Roundtables: In October of 2003, two roundtable consultative meetings were held at ESPOL University in Ecuador and at Zamorano University in Honduras. These roundtable meetings brought together a wide grouping of university, government, and NGO representatives from Ecuador, Nicaragua, El Salvador and Honduras to learn more about the Sea Grant model and how it can be applied to their needs. Dr. John Jacobs an extension specialists from Texas Sea Grant provided a series of presentations that clearly explained the linkages between applied research, extension and education that allows the Sea Grant model to effectively address marine and coastal issues.

Maryland Sea Grant and NSGO Study Tour: in February 2004, Maryland Sea Grant Program Director Jonathon Kramer hosted Agnes Saborio Coze from UCA in Nicaragua. He offered an in-depth look at the administrative and programmatic set-up of the Maryland program and also arranged a tour of the new aquaculture research facility at the at the Horn Point Environmental Laboratory with Maryland Sea Grant Extension Specialists. Agnes Saborio Coze also was hosted by the National Sea Grant Office which offered an in-depth look at how the NSGO office coordinates the 31 state programs.

White Water to Blue Water: In March of 2004, representatives from the University of El Salvador, Zamorano University and the University of Central America in Nicaragua participated in the White Water to Blue Water Conference in Miami. Martha Zetino, Luis Caballero, Dan

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Meyer and Agnes Saborio Coze were involved in a series of breakout sessions, roundtables and a Sea Grant 101 course as part of the conference. Sea Grant Directors Barry Costa Pierce (RI), Jim Cato (FL), Mac Rawson (GA) and extension specialist John Jacobs (TX) provided advice and guidance to their Latin American counterparts during several sidebar meetings as did retired Puerto Rico Director Manny Hernandez.

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NOAA
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**Sea Grant University Cooperative Agreements
and International Activities Summary**

For over twenty-five years, many of the domestic Sea Grant programs have been involved in informal and formal collaboration with academic, government and NGO partners in many regions of the world. The below list of cooperative university agreements and international activities is certainly not exhaustive and NOAA Research Office of International Activities welcomes dialogue with programs that are interested in sharing their international experience.

Rhode Island Sea Grant College Program:

- The University of Rhode Island has played a critical role in exploring the feasibility of adapting the U.S. Sea Grant model of applied research, extension, and education to Latin America and the wider Caribbean. Rhode Island Sea Grant has been actively working with NOAA Research's International Activities Office and the Coastal Resources Center in regard to two pilot sites, the Gulf of Fonseca (**Nicaragua, Honduras and El Salvador**) and coastal **Ecuador**.

Texas Sea Grant College Program:

- Texas A&M University played an active role during the in-country roundtable discussions that took place in **Ecuador** and **Honduras** in October 2003. These roundtable discussions were focused upon exploring the feasibility of adapting the U.S. Sea Grant model of applied research, extension and education to a developing country context.
- Texas Sea Grant is currently working with **Mexico** to explore the feasibility of developing Sea Grant extension programs in the Yucatan Peninsula.
- Sea Grant Texas is also providing consultative services to the Climate Center (**Belize**) developed as a result of a joint National Ocean Service/Caribbean Community, CARICOM "*Mainstreaming Adaptation to Climate Change in the Caribbean*" Project (MACC). The goal is to develop a framework to extend climate-based information to user constituencies throughout the wider-Caribbean using the Sea Grant model of extension and education.

Florida Sea Grant College Program:

- The University of Florida currently has a Cooperative Agreement with the Escuela Superior Politecnica del Litoral (ESPOL). This agreement with this coastal **Ecuadorian** university has a primary focus of educational research and exchange opportunities.
- There is a cooperative agreement with the **Caribbean Agriculture Research and Development Institute (Trinidad)** and the University of the West Indies (**Jamaica**). This collaboration was developed to promote exchange between faculty, researchers and students in food and agricultural sciences.

Puerto Rico Sea Grant College Program:

- The University of Puerto Rico Sea Grant College Program is an educational program devoted to the conservation and sustainable use of coastal and marine resources in Puerto Rico, the **U.S. Virgin Islands** and the **Caribbean region**. For over two decades the program has been working to promote

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sustainable development and the wise use of marine resources in **Latin America** and the **Caribbean** region (LAC).

Georgia Sea Grant College Program

- The University of Georgia has study abroad/student exchange programs with several Universities in the **LAC**. The Universities include but are not limited to: the Universidad Veracruzana and the Universidad Autonoma de Guadalajara located in **Mexico** and Earth University and Ecologe San Luis and Research Station, located in **Costa Rica**.

Connecticut Sea Grant College Program

- The University of Connecticut (UCONN) is associated with the Caribbean wide activity/project headed by the University of West Indies (**Jamaica**). This is a Coastal Resource management project partnering with the University of Central America and the Centro de Investigacion y Documentacion de la Costa Atlantica (**Nicaragua**), and the Aquaculture branch of the Ministry of the Atmosphere and Recursos Naturales (**MARENA**).
- The International Affairs Department at the University of Connecticut is currently hosting Ms. Lafarga de la Cruz who is obtaining the training necessary to develop a Sea Grant like extension program in the State of Baja California **Mexico**. This is part of the exchange between UCONN and the Universidad Autonoma de Baja that was developed to strengthen student and educator opportunities through collaborative research on problems affecting coastal resources.

Mississippi-Alabama Sea Grant College Program

- The College of Agriculture at Auburn University has a fresh water quality education and monitoring program with **Ecuador**. This agreement is through the University of Georgia and it is supported by USAID via Sustainable and Natural Resources Environmental Management and Collaborative Research Support Program.
- The College of Agriculture at Auburn University has a small-scale fresh water aquaculture project taking place in **Honduras** in cooperation with the University of Zamorano. With support from USAID via Pond Dynamic Aquaculture Collaborative Support Program, this project is carried out through Oregon State University.
- The College of Agriculture at Auburn University has an agreement with **Brazil** sponsored by the Christian Children's Fund for watershed management and improved water quality and quantity in Brazil.

New Hampshire Sea Grant College Program

- The University of New Hampshire has a National Guard State Partnership Program with the University of **El Salvador** and the Salvadoran Ministry of Environment and Natural Resources. This program focuses on the improvement of El Salvador's water supply and waste management. The universities are currently looking to develop a student exchange.

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Section 3: Roundtable Reports

Ecuador Round Table Final Report: October 2003
Gulf of Fonseca Roundtable Final Report: October 2003

Ecuador Roundtable Report: October 2003

This report consists of four items:

1. Detailed transcript of the proceedings for the Round Table
2. Two page executive summary of key findings and highlights from the Roundtable
3. Summary of the views expressed on each major agenda item.
4. Summary of participant's comments and suggestions related to the draft of point 3.

1. Detailed transcript of the proceedings for the Round Table

Background

- a. By the end of July 2003, a NOAA-CRC team visited Ecuador. This team was formed by Jill Hepp (NOAA Research Office of International Activities) and Jim Tobey (CRC-URI). Both of them held meetings with national and international entities personnel, directly or indirectly involved in Ecuador coastal and marine resources use and conservation.
- b. Tasks team were: i) to consult entities interest and point of view in relation to an potential Sea Grant Program in Ecuador; ii) to have a direct impression of the actual activities being executed in the different programs and initiatives in develop in Ecuador, linked to the conservation and sustainable use of its marine and coastal resources; and, iii) to invite all interviewed people to a Round Table on these matters, that would be held in October 2003.
- c. Entities and personnel visited in July were contacted by two medias: meetings with USA Embassy personnel were done by Jill Hepp, and the others were concerted by Emilio Ochoa.
- d. By the end of the NOAA-CRC team visit, there was held a closure meeting among Jim Tobey, Jill Hepp and Emilio Ochoa, in order to agreed on basic ideas for October meeting. Ideas that came from this closure meeting were discussed with Eduardo Cervantes (Dean of the Faculty of Maritime Engineering and Sea Sciences of ESPOL), who was designed by Rector ESPOL as the official interlocutor for this matter.
- e. The agreements of the meetings were:
 - Prepare a one-day Round Table, with eight effective hours of work.
 - The hosting place would be Campus Las Peñas of ESPOL, in Guayaquil.
 - The Round Table dates would be between October 16th and 18th, even though these dates matched the Aquaculture National Congress, which meant the aquaculture sector and its related entities would have their agenda already compromised.
 - There would be thirty-five participants, representing several entities in Quito, Guayaquil and other coastal cities. It was desirable that participants would be on top level. Among potential participants were: TNC, CI, WWF, Fondo Ambiental del Ecuador and Fondo de Investigación del Consejo de Universidades representatives, el Asesor del Ministro del Ambiente; Peace Corps, USAID, BID, PNUD specialists; Decano de la Facultad de Ingeniería Marítima y Ciencias del Mar de ESPOL, Decanos de siete universidades costeras, incluye dos de Quito, especialistas del INP, INOCAR, CENAIM, Centro de NNUU para El Niño, el Subsecretario de Gestión Costera, Subsecretario de Pesca, representantes del Programa de manejo de Recursos Costeros (PMRC), de la Cámara de Acuicultura, y Cámara de Pesca.
 - The themes would be: i) What is the Sea Grant Model, and how does it work in USA, ii) Opportunities, problems and priorities for sustainable development and conservation of marine and coastal biodiversity in Ecuador, iii) Desirable outcomes from here to 10 years in a potential Sea Grant Program in Ecuador, and iv) guidelines in order to help to structure a Sea Grant Model in Ecuador.

Round Table proceedings

1. A list of potential participants was formulated. This list was circulated among the members of the Round Table work team, and it was subject to comments and suggestions from the members of NOAA, CRC and ESPOL team.
2. A provisional agenda for the Round Table was developed. This agenda was also consulted with NOAA, CRC, and it was subject to their comments.
3. The material that was to be used in the RT was collected. This implied the translation of Background Paper # 1, which was circulated among invitees and NOAA and CRC members team.

4. It pass through the final invitees list, and then a process of collecting contact info begun. This contact info was: complete name, entity they work with, charge they hold, phone number and e-mail.
5. The exact date for the RT was settled down to October 16th, this date matched with the Aquaculture National Congress, as it was previewed.
6. Stephen Olsen's suggestions and comments were taken into account for the agenda final version.
7. Once the agenda and invitee list was reviewed, the formal invitations were sent by e-mail to the participants. Those e-mail invitations were attached with the final version of the agenda and the Spanish version of Background Paper # 1.
8. It was critical to e-mail the Spanish version of Background Paper # 1 to the invitees, because it was the material the group work during the Round Table was based on.
9. Rector of ESPOL was asked for support in resources and efforts in order to fulfill the Round Table expectations. This convey, among other things, in logistic and financial support to organize a post-Round Table event (work dinner) among invitees of RT and people representing important studies centers. This event was totally organized by ESPOL.
10. The final version of the formal invitation with Rector of ESPOL signature was worked out.
11. Invitations were sent out to all the participants at national level. Invitations were sent out jointly with the final version of the agenda.
12. There was a confirmation for logistic or financial support to participants coming from other cities than Guayaquil.
13. There was a controlled follow up in the confirmation of the participants in which it was detailed who had confirmed the participation by e-mail, fax, phone call; who couldn't participate because he already had his agenda full, but would delegate it to someone else; and who couldn't participate and couldn't delegate it to someone else.
14. All invitees of the Round Table assumed their transportation and hotel expenses.
15. A design of a folder for the Round Table was worked out. This folder would contain the agenda of the event, Background Paper # 1 Spanish version, and paper sheets for notes.
16. Once the design of the folder was approved, the designs and the material were sent to ESPOL in order to print them.
17. Cards with the name of the participants and the entities they represent were asked to print out by ESPOL.
18. ESPOL made some arrangements in order to held the Round Table in one of its post grade class rooms.
19. The Power Point Projector was rented for the Round Table presentations.
20. Lunch and coffee breaks for the Round Table were contracted.
21. On October 6th, Matt Wilburn office organized a teleconference with CRC-URI – Sea Grant office, Proarca, Zamorano, UCA, John Jacob, and EcoCostas personnel involved in the Round Table. Details of the organization (logistics) of the Round Table and its progress were reviewed and checked.
22. ESPOL made arrangements in order to get support from five attaches during the Round Table, so participants can direct themselves to the post-grade classroom selected for the RT.
23. On October 15th the final review of the Round Table agenda and presentations was done by John Jacob, Jim Tobey and Emilio Ochoa. Final changes were done because of Stephen Olsen and Matt Wilburn Round Table nonattendance.

2. Summary of key findings and highlights from the Roundtable

Key findings refer to four main aspects: Main orientation among the participants issues of concerning, reactions on the proposal value, reactions on the proposal opportunity and the willingness to invest in it, and general recommendations.

Main orientation

Considering the main orientation of concerning, consulted people represents two huge groups: the first one oriented to biodiversity conservation and stewardship, and the second one oriented to coastal and marine resources productive uses. The first group is formed by participants from TNC, WWF, CI, ECOLAB (Universidad de Sna Francisco), whose main offices are settled down in Quito. The second group is formed by participants from ESPOL, Universidad Católica, PMRC, Centro Nacional de Acuicultura e Investigaciones Marinas (CENAIM) and their main office is settled down in Guayaquil.

The first group of institutions works in both, coastal continental and insular areas (Galapagos), although its presence in Galapagos is older. Initiatives and efforts of the first group have been articulated as more or less stable projects and tend to grow in time and geographic scale: one of the marine initiatives with broader scope is the one sponsored by CI, in Galapagos-Cordillera de Cocos zone, but initiatives as such as important and relevant as this, are the one sponsored by TNC and WWF in the Pacific eco region, or by CI in the continental coast in Choco-Manabi area. CI, TNC and WWF work as ally with NGO's and local and internal stakeholders, so their influence is significant and continuous in conservation effort, especially through the protected areas strategy. The role of these actors in the changes of Galapagos legislation is very remarkable.

The influence zone of the second group is almost exclusively the continental coast. The teamwork is formed by several branches of engineering and biologists. Until recently, their efforts have been focused in specific projects, although now there is an emerging long-term research line in areas such as aquaculture and banana, and pre graduate careers on environmental management and marine biologist.

An important number of participants work or are interested in both orientations (USAID and Peace Corps for example, had supported both orientations, and so the Instituto Nacional de Pesca, Instituto Oceanográfico de la Armada, Centro de Investigación de El Niño, Escuela de Biología de la Universidad de Guayaquil, among others).

The diversity of actors and the growing strength of its presence in coastal management themes makes it visible that in the next years would be a growing increment of support and cooperation between these two orientations that have been developed until now in relative independence.

Reactions on the proposal value

Interviews in July, Round Table in October, and some comments regarding the document *Background Paper 1* reveal evident interest and support for impulse an initiative like Sea Grant Program in coastal and marine environments of Ecuador. The opinions support or comment several of the ideas written on *Background Paper 1*, correspond to five groups and specially highlight the value of the following aspects:

Long term planning and continuous funding

- it would be very helpful for the actor group of the system, to prepare and/or develop a national agenda for the coastal and marine zone management.
- This agenda would provide an Strategic Plan (long term one) that system actors could consider to prepare their triennial or annual plans.
- It would provide a more clear horizon for alliances, cooperation and leverage.
- It'd also provide operative mechanisms for the execution of national and municipal policies.

National commitment with the topic

- It would provide a greater sense of institutional responsibility, according to the opportunity and relevance of the information.
- It would put on users hands important information for decision making, that would mean that in the long term it would help to improve the prevision and equity of decisions.
- It would improve the general knowledge of populations about the implications of the decisions to be adopted and it would contribute to a more intelligent execution of democratic resources.

Integration of research, education and extension

- It would accelerate the development of extension programs, which is the weak point of the work in Ecuador.
- The link between research and education with extension would ensure that knowledge is incorporated more and directly to the users of resources and environments.

- Integration of extension, research and education would provide advantages and opportunities for universities, users, government and the net of actors.

Independence on the functioning

- Comities participation on the several levels of the system would provide a balance in the decisions.
- The organization of Sea Grant system as an independent structure of a governmental or university authority, decrease the discretionality level of decisions.
- Decentralized independence and functioning are basic for the continuity of efforts.

Accountability and quality control mechanisms

- It would provide standards and a clear process so the entities of the net can advance from one step to another inside the system.
- It would provide periodical certification mechanisms of the net members capacities.
- It would provide quality control mechanisms of the proposals and the outcomes.

Some comments refer on the convenience of building the system with exclusive base on universities, or if it is convenience a mixed net of universities and research centers such as INP, CENAIM, INOCAR, Centro de El Niño.

Reactions on the opportunity of the proposal

The governmental and private effort of management in Galapagos has several decades, and even though it is more recent at the continent, it already has fifteen years. During this period several laws have been expanded; several dependencies with mandate for management (such as PMRC and Coastal Environment Management Sub secretary) and the Ministry of Environment have been conformed; norms have been established; experience on projects of research, development, conservation, etc., has been accumulated. This effort has created and strengthened a social demand to establish a stable program in Ecuador, which allow articulate spread efforts, and give them continuity within a similar scheme as Sea Grant.

The demand perceived in Ecuador is also perceived in Central America an Mexico, so now is coming up an international current that claims for mechanisms and approaches that integrate existing efforts in universities and other entities in order to ensure conservation and stewardship of coastal ecosystems.

Everyone expresses willingness to participate in a network such as this and to cooperate for its work.

General recommendations

- Reaffirm to NOAA and CRC the interest in walk with and support the elaboration of a proposal for the implementation of a similar Sea Grant system in Ecuador.
- Maintain contact among the people that has participated in the interviews held in July and in the Round Table of October, and to ensure the mutual interest flow of information (including the similar initiative that is being developed in Gulf of Fonseca).
- Affirm the necessity of conforming a Sea Grant like National Network, for coastal ecosystems management.
- EcoCostas should maintain the coordination among participants during this period.

Ecuador Roundtable Agenda (spanish version)

Lugar	Campus <i>Las Peñas</i> de ESPOL, en Guayaquil
Fecha	Octubre 16 del 2003
Hora	08h30 a 17h50
Facilitador	Emilio Ochoa, Director Ejecutivo de la Fundación EcoCostas.

Participantes Representantes de Centros de Educación Superior y de Investigación, de Entidades Gubernamentales y del Sector Privado, y de Organismos Internacionales vinculados al desarrollo sustentable y a la conservación de los Ecosistemas marino-costeros del Ecuador.

Ejes de trabajo

1. Qué es y cómo trabaja el modelo Sea Grant.
2. Oportunidades, problemas y prioridades para el desarrollo sustentable y la conservación de la biodiversidad marino-costera en Ecuador.
3. Resultados deseables a 10 años para un eventual Sea Grant en Ecuador
4. Lineamientos para estructurar un modelo Sea Grant en Ecuador

Distribución del tiempo

- 08h30 - 08h40 Inscripciones y entrega de documentos.
- 08h45 - 09h10 Apertura del taller. Stephen Olsen, Director del Centro de Recursos Costeros de la Universidad de Rhode Island (CRC-URI)
- 09h10 - 09h30 Presentación de los participantes. Facilitador, Emilio Ochoa, EcoCostas
- 09h30 - 10h15 *Qué es y cómo trabaja Sea Grant en EEUU. Qué ha significado el Programa Sea Grant para EEUU? Preguntas y respuestas.* John Jacob, Texas A&M Sea Grant.
- 10h15 - 10h30 Receso
- 10h30 - 11h10 *Temas críticos sobre los usos productivos, la conservación y el manejo de la biodiversidad marino-costera del Ecuador: oportunidades, problemas y prioridades para el desarrollo sustentable y la conservación.* Luis Arriaga Mosquera, Director del Instituto Nacional de Pesca.
Presentación (20 minutos) y Diálogo de la sala con el expositor (20 minutos)
- 11h10 - 12h10 *Identificación de los puntos críticos en los usos productivos, la conservación y el manejo de la biodiversidad marino-costera del Ecuador, y resultados deseables a 10 años.*
Trabajo en tres grupos (30 minutos) y presentación (10 minutos por grupo)
- 12h10 - 13h05 *Programas de investigación, extensión y educación que llevan adelante los centros de educación superior y otras entidades, relacionados con la conservación y buen uso de nuestros recursos marino-costeros.* Presentaciones de los representantes de ESPOL, TNC, WWF, CI, INP, PMRC y Cerro Verde. Ocho minutos por expositor.
- 13h05 - 14h00 Almuerzo
- 14h00 - 14h40 *Principales componentes del Sea Grant: investigación, extensión, y educación. Ejemplos de como el Sea Grant puede contribuir para resolver algunos de los obstáculos identificados en los usos productivos, el manejo y la conservación de los recursos marino-costeros.* John Jacob.
Presentación (20 minutos) y Diálogo de la sala con el expositor (20 minutos)
- 14h40 - 15h45 *Oportunidades y Obstáculos para establecer un eventual Sea Grant en Ecuador, a partir de las experiencias y estructuras existentes.*
Trabajo en grupos y presentación en plenaria (División en grupos: se trabajará sobre Oportunidades y Obstáculos en el campo de la producción y usos sustentables, y en el de conservación de la biodiversidad.)

15h45 - 16h00 Receso

16h00 - 17h30 *Lineamientos para estructurar un modelo Sea Grant en Ecuador.* Trabajo en grupos (50 minutos) y Presentación en plenaria (10 minutos por grupo)

- Pasos para el desarrollo de un Modelo Sea Grant en el Ecuador (Documento Sea Grant pp. XX)
- Líneas de acción prioritarias en las cuales desarrollar una masa crítica de actividades y resultados Sea Grant en los próximos 5 años.
- Potencial de las instituciones para lograr las fortalezas y condiciones de éxito en un eventual Sea Grant (Documento Sea Grant pp.XX)
- Aportes para el financiamiento (*threshold for match*). Posibles fuentes y mecanismos de financiamiento para una iniciativa nacional y regional.

17h30 - 17h50 Cierre del Taller.

Resultados esperados de la Mesa de Conversación

1. Propuesta de prioridades del Sea Grant en el contexto de Ecuador.
2. Recomendaciones y lineamientos para estructurar un programa piloto Sea Grant en Ecuador.
3. Bases para una cooperación en la red Sea Grant (Ecuador - Centroamérica - EEUU).

Nota: Favor dirigirse a ecocostas@ecocostas.org, o a los teléfonos (04) 2452 698-9, para confirmación de asistencia y cualquier información.

Ecuador Roundtable Participant List: October 2003

	Participante	Cargo	Institución	Ciudad	Teléfono	E-mail
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12	Gunther Reck	Director Ejecutivo del Instituto de Ecología Aplicada, ECOLAP	Universidad San Francisco de Quito	Quito	2895 723 (427)	gunter@mail.usfq.edu.ec

Latin America and Caribbean

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28	David Matamoros	Proyecto VLIR-ESPOL	ESPOL	Guayaquil	2269 269	dmata@espol.edu.ec

Gulf of Fonseca Round Table Workshop
“Towards a Sea Grant Program in the Gulf of Fonseca”
October 21-22, 2003

The Workshop began at 8:40 a.m.- as the previous Agenda stated (Annex 1)

To begin the meeting, the members of the table, who presided, were introduced as follows: Dr. Hoadley, Director of Zamorano; Dra. Mayra Luz Pérez, Vice Rector of the Central American University (UCA); Sr. David Alarid, Director of the Environmental Center for Central America and the Caribbean and Dr. Daniel Meyer.

Dr. Hoadley welcomed the participants and briefly mentioned the challenges Zamorano faced. He also mentioned the importance of the work they do in the Gulf of Fonseca.

Next, **Mr. David Alarid** spoke briefly giving thanks to NOAA, Zamorano and UCA for their active participation in this process. He also spoke on the importance of the Gulf and on the efforts for sustainable development.

The table retired at 8:50.

Introduction- Emilio Ochoa gave a general overview of the meeting objective, the role of NOAA, the role of the Coastal Resources Center of the University of Rhode Island and the motive for Sea Grant.

9:15 - 9:30 Presentation of the persons assisting. (See Annexed 2)

9:30 Coffee Break

9:45 -10:10 PROARCA's analysis and perspective of the needs of the Gulf of Fonseca based on a model similar to Sea Grant- Nestor Windevoxhel, Director of PROARCA

Dr. Windevoxhel began by explaining the following: the historical process of the 1990 construction of the biological corridor in the Gulf of Fonseca; achieved results, such as the support to municipalities, design of the biological corridor; and better practices for shrimp aquaculture.

He briefly described the biological corridor and the lines for an action plan. He also recommended the implementation of the biological corridor in the Gulf of Fonseca. He concluded stating that this degraded area requires restoration of the dry forest, the swamps and the water quality.

After the meeting, the exhibitor discussed his opinion of the shrimp culture in the area. He explained that this activity in many cases had substituted the swamp system. He also mentioned the adaptation of the ecological system.

10:15 - 11:00 “The Experience of Sea Grant in the United States: What is it and how the Program works” - John Jacob, University of Texas A&M Sea Grant.

He began his presentation explaining the antecedents of Sea Grant, including information on the Land Grant. The three primary components were research, extension and education. He explained how the University services the community and how the community contributes to the university being a good "contract" to serve to the community. This constitutes the base of all promoters and extension agents. He explained the role of the specialists that serve as communicators between the investigators and promoters sharing investigations and working directly with promoters. The financing

of the program was also mentioned in this presentation. "Committees" to elaborate strategies, bound investigation to the extension. There was a "Peer review" section and finally, he enumerated the thematic information on Sea Grant.

At the conclusion of the exhibition, work groups were formed. The groups were chosen so the members were not from the same country or institution. This was done to ensure that all positions were represented and different visions were brought forth. There was also a designated facilitator to provide group support when necessary. (See Annex 3)-The participants are listed by their groups.

11:00 - 1:10

Group Work

Topic: Relationships between education, extension and investigation of Sea Grant and the financing mechanisms. Each group analyzed the Gulf and the resources we have as well as those we lack for the feasibility of the pattern.

Results of the First Work Session:

The value relationships between education, extension and investigation in Sea Grant:

The four conformed groups coincided in the idea that the implementation was opportune, viable, innovative and positive. They considered that it allows for continuity of the most positive values of this initiative and it is detached from political sways. They added that this would serve from stimulus to other actors. One of the virtues of the program was the advantage of integration amongst the investigation with the politicians and the communities. The integration and linking among different activities like the production, conservation and handling was also considered positive. It could promote synergies and facilitate the cooperation in general. The linking of Universities was also greatly valued.

What resources are available for the feasibility of the pattern?

All the groups coincided that there are human resources in the region. It was also mentioned that there is substantial institutional capacity at the universities and other institutions. One of the groups considered that there are initiatives in the institutions. Regional projects were also considered to be positive. Information exists and there is also a substantial amount of experience.

What resources do we lack for the feasibility of the pattern?

The first common agreement is the lack of political will for integration at an intra and inter institutional level. Another point mentioned by all the groups is the lack of economic resources on behalf of the countries. It was considered on behalf of three groups that legal instruments exist, but are not executed. In many occasions a lack of awareness existed because the decision makers had a lack of information. One of the topics was the lack of real and effective coordination among the countries. The institutions and the actual programs and projects were mentioned. The regional initiatives however, were not clearly defined. Another difficulty is linking human capital with the universities. There is a lack of long-term programs and those that exist or existed in the past are punctual projects. The lack of a base line for the ecosystems was also mentioned. Lack of continuity and follow up was a problem and lastly, the lack of integrative mechanisms between investigation, extension and education.

The idea of the mechanisms of financings:

There was a discussion among the groups, and they stated that the pattern of financing that the local government maintained which had been exposed, did not apply due to the situations of their countries. The Governments do not have the money to finance the programs and sometimes appeal

to international support just to meet their needs. It was agreed upon that it would be necessary to look for other financing, taking into account the need to have a bottom seed with external funds that is secured for a reasonable term in the program. It might be possible for the governments to contribute in long-term programs by means of departures or by having specific funds designated for the programs. It was also deemed important because the international cooperation is diminishing.

1:10 -2:00 Lunch

2:15 - 3:00

Critical topic in the productive activities and in the conservation and handling of biodiversity in the Gulf of Fonseca

Edas Muñoz, Technical Adviser of PROARCA

Mr. Muñoz exposed the goals of the biological corridor, its objectives at regional level, social and economic, ecological, regional and pragmatic approaches. He spoke about the eco existent regions and mentioned the corridor was 55% dry forest and that it is in a critical state. 43% is constituted by ecosystems of swamp and it is also in a critical state. The investigation of faunas is also important. Presently, the birds are the most investigated and the amphibians and reptiles receive little attention. The information on marine flora is limited. The exhibitor mentioned that it is necessary to make a systematic effort to know the state of all populations.

He also mentioned the use of the resources in the region since the residents live by fishing and by using mangrove extraction for firewood and housing. Their shrimp activity has also brought approximately 150 million dollars in the region.

As common threats, he enumerated the shrimp expansion, the expansion of areas for agricultural use, the mangrove elimination and sedimentation process. He also mentioned problems that posed direct threats which included: terrestrial degradation, depositing waste in the coastal and marines ecosystems, high levels of contamination; loss of floors, discharge of silts, discharge of chemical products, petroleum storage, escorrentía, firewood extraction and overuse of marine resources.

He explained the causes of these threats, which included: holdings of the earth, the open accesses to the resources and scarce leadership (mainly in the governmental institutions).

Finally, he explained the three programs focused on the biological corridor and concluded that the ecosystem has to be managed and requires upkeep.

3:00 - 4:30

Second Work Session:

The groups made a brief list of projects executed in the last five years or those presently taking place. They selected a successful case and one less successful, proposing explanations for the successes and difficulties, which focused on the institutional aspects of the cooperation.

4:30 -5:10

Discussion in plenary one:

Successful experience:

A group identified a successful project in Nicaragua. The CIDEA / UCA, projects are being recognized for having trust in the private sector. It appears that CIDEA gives support to the small producer and the municipality.

Honduras: NOAA Sea Grant supports the shrimp project and has extension agents. They also partake in Post Hurricane Mitch Reconstruction.

El Salvador: PROGOLFO presently has a communal organization and government support.

Other Identified groups: PROARCA and COSTAS

Explanations of success were as follows:

Flexibility, practical and useful programs, communication, a strong extension role, coordination with diverse actors and activities and the actors' organization

Explanations for little success were as follows:

Problems pertaining to bureaucracy, lack of communication, inflexibility, difficulties with personnel, difficulties based on distance and lack of popularization.

Third work session:

The groups identified the main desirable benefits for a ten years Sea Grant model in the Gulf.

Main results, in terms of productivity:

- 70% had applied good aquaculture practices
- 50% had productions directed to specific markets

Main results in conservation terms and biodiversity:

- Inventory of the biodiversity
- Sustainable management of the biodiversity
- Restoration of the 20% of ecological systems
- Environmental education at school level
- Change of attitudes in people and producers.
- Minimization of the degradation of ecosystems
- Consciousness amongst authorities

Economic and environmental changes:

- Improvement in production
- Access to different markets
- Decrease impact of shrimp enterprises
- Better quality of water
- Recovery of swamps
- Identification of economically valued species

Institutional changes:

- Definition of BMP
- Specialized institutions developed certification and market requirements
- Strengthened the investigation about non traditional SP
- Strengthened the biodiversity investigation
- Changes in the conservation strategy and investigation
- Establishment legislative agreement
- The creation of new proposals for projects

Comments:

- Extension
- Flexibility
- Coordination
- Country independence
- Realism in the perspective

5:10-5:25

White Water to Blue Water

David Alarid

The purpose of this initiative is to stimulate alliances and promote the integration of basin handling in marine coastal ecosystems. The initial focus is on the Caribbean region. Some of the main problems and their impacts were also mentioned.

Goals:

- To strengthen alliances between NGO's, governments and universities
- To promote training
- Additional partnerships, alliances and associations

The planning for next year's Miami conference took place. It will focus on the following areas: Administration of environment, sustainable tourism, administration and basins.

The work session ended at 5:30 pm.

7:45 - 8:15

How Sea Grant maintains the quality and the neutrality of their work (key elements). Structure of Sea Grant - John Jacob

The universities pass a process of accreditation that belongs to Sea Grant and include the following four steps:

- Sea Grant committees are formed. Recently, an extension committee was formed and it included environmentalist, fishing, and officials. It is necessary that the committees represent the views of the people.
- The actor's involvement: This is important because there are some topics that produce controversy between the governments and the producer. The university is supportive and intervenes to maintain the neutrality.
- Investigations of high quality: It is one of the important factors necessary to have investigations published in credible magazines.
- Planning and Evaluation: It is necessary to have planning. The plans are on a national level and committees are involved. For this type of planning, it is necessary to set appraisable goals. A methodology of constant and very serious evaluation exists.

8:15 - 8:30

Regional Institute of Biodiversity for the Development by: Jorge Restrepo and Miguel Gallant Alberto.

There was a brief intervention to explain the project of the “Regional Institute of Biodiversity for Development.” This initiative was developed and agreed upon by the Ministers of the Environment in the Meso-American countries, with the objective of promoting the improvement of the quality of life for the inhabitants of Central America through the conservation and the reasonable use of the resources. The investigation was used for popularization and development. The Institute’s headquarters are in Zamorano. Apart from the government, some centers, universities, foundations and projects will incorporate other affiliations. When concluding the exhibition, a delegate of the University of Central America (UCA) expressed their interest to participating and to have knowledge on the evolution of the Institute.

8:40 - 10:00

Fourth work session

The groups were asked to identify two or three questions relative to the structure of a Sea Grant model in the Gulf of Fonseca and to propose several answers. They were also asked to propose concrete mechanisms to assure the neutrality and the quality of the work of Sea Grant in the Gulf.

Certifications:

- Approaches
- Stages
- External evaluation
- Users' feedback

Structure:

- Regional
- National
- Institutional
- University and non-university capacity
- Link with the national objectives

Relative key considerations for implementing a Sea Grant model in a university within the Gulf of Fonseca. Process of certification and accreditation, through internal evaluations that would allow it

Previous process for stages, subject to monitoring

- Flexibility
- Beneficiaries' and users' feedback of the programs that were executed.
- Evaluate Human Capital
- Infrastructure and direct presence in the Gulf of Fonseca
- Centers of Investigation
- Administrative Agility
- Transparencies

Relative key considerations for the structure of a Sea Grant model in the Gulf and the process of implementation.

- It should be part of the universities' structure and could be attributed to Faculties or Vice Rectories
- It should have a structure for country support coming from all groups
- Include a University executioner
- Establish a Sea Grant unit inside the University

- Establish a Committee of University Pursuit, so it guarantees the program is being incorporated in the University.

Concrete mechanisms to assure the neutrality and the quality of the Sea Grant model

- Constitute a SG committee at regional level for regional coherence
- Conform a SG committee for integrating government, private companies, unions, universities and communities for the planning, evaluation and pursuit.
- Constitute a scientific committee to implement the revision of pairs, in the case of the investigations. This will ensure that the investigations and documents are in agreement with scientific methodology. The three countries will integrate this regional committee.

The Vice Rector of the UCA expressed that this program does not summon universities alone but challenges us as a country. There will be a collective effort to form Central American relationships, begin alliances and develop cooperation. She intends for us to be creative.

10:25 - 11:45

Fifth work session

Individual group work continued in an effort to develop the key steps to begin the process.

Basic Pre conditions for the success of a Sea Grant model in the Gulf

Regional Actions:

To achieve regional consent of the regional objectives

National Actions:

- Selection of the ideal process of institution, including the academic aspects as well as the perception of the users
- To determine the institutions' ability to manage the challenges being presented.
- Political will, agreement subscription or letter of understanding to the groups involved in this program. (Government, associations, and university)
- To begin concrete actions on behalf of the university and strengthen all aspects.
- Provisional Committee to define the pattern of a Sea Grant model that is equipped to meet the needs of our region.
- To base the construction of that pattern on existing foundations in the region
- Consult with the CCAD
- Develop a draft of the pattern (with proper consultation)
- Define areas where the SG Program will be concentrated (biological corridor, half basin, coastal area)
- Make inventories of projects existing in the area, and research achievements, findings, etc.
- Begin seeking funds.
- Meet with Ministers of the Environment and other involved ministries or government's that can give suggestions.
- Develop a detailed document on the internal organization within the university, including the approach and the different stages.
- Create national groups for support.
- Create a commission among the university.
- Share information on the Gulf of Fonseca and AID through the Internet and databases.

Next steps to begin the process

Documents distributed

- WW2BW
- Biological corridor
- Cidea
- Zamorano
- PROARCA

COMMENTS AND SYNTHESIS OF THE MEETING

The Sea Grant program is an opportunity for Central America. This program along with the conformation of the Free Trade Treaties, CAFTA, international regulations, and with the urgent demand of sharing information, will help improve environmental degradation in critical areas and the region economically.

The necessity of a Sea Grant program in the region was deemed necessary, opportune, viable, innovative and positive. The most important aspect the program is continuity, which will give ample time to produce results in educating and the investigating. Another important benefit of this program is providing an impartial vision between the community and the government and an impartial vision among the different actors, including the producers, environmentalists, aquaculturalists and others.

Developing relationships between the countries to share information was also seen as beneficial. It is important for the countries to have common objectives, while maintaining independence.

Having a strong human resource department and substantial institutional capacity was seen as a positive aspect of the program. The main weaknesses included the lack of political will within the countries, the lack of economic resources, lack of coordination between the institutions and a lack of continuity and pursuit.

In relation to the mechanisms of financings, all agreed that characteristic, was a needed capital " seed " along with the long-term gradual incorporation of other funds.

The two most successful experiences using a Sea Grant model were carried out in Honduras and Nicaragua with the universities of the Zamorano and the Center for the Investigation of Aquatic Ecosystems of the University of Central America (UCA), following Hurricane Mitch. The reasons for the success were as follows: flexibility, wide consultation, strong extension component, and a lot of communication.

The less successful and non-successful experiences that were mentioned resulted from lack of communication and inflexibility.

The high-priority topics that stood out were: problems with the water quality, high sedimentation levels, problems with microbiological water quality, disappearance of mangroves, disappearance of dry forest, fishing exploitation and ignorance of the fauna and flora.

Sea Grant was considered an ideal program to support the sustainable development of the region because it includes aspects that are likely to produce success. It would also allow for more economic

opportunities for an ecologically vulnerable area. Lastly, it would allow for the exchange of information and the exchange of action plans.

In terms of results, investigations will be considered to monitor the water quality and to focus on the points of contamination as well as the polluting activities. This program would equip shrimp producers with better handling practices thus, allowing them to increase their productivity with less harm to the environment. Within the biodiversity inventory, restoration of ecological systems is among the most important. Also, this program is geared towards campaigns that produce a change of attitudes in people and producers, oftentimes making authorities more conscious of problems. In conclusion, this program will lead to better communication among the actors in the Gulf of Fonseca.

ANNEX 1

Gulf of Fonseca Roundtable Agenda: October 2003

Tuesday

8:30a.m. – 8:40a.m. Inscriptions and delivery of documents

8:40a.m. – 8:50a.m. Introduction of the opening workshop

8:50a.m. – 9:05a.m. Workshop objectives and revisions of the agenda - Emilio Ochoa

9:05a.m. – 9:15a.m. Participants' presentations

9:15a.m. – 9:30a.m. Analysis of the Gulf of Fonseca's use of a Sea Grant Model- from PROARCA's perspective- Néstor Windevoxhel, Director of PROARCA.

9:30a.m. – 10:05a.m. The Sea Grant Experience in the United States: What it is and how the Program works- John Jacob, University of Texas A&M. Presentation thirty minutes, dialogue five minutes.

10:05a.m. – 10:50a.m. First Group Activity

Topic: Relationships among education, extension and investigation in Sea Grant and financing mechanisms.

Each group will analyze two aspects: 1.) the conceptual value of the idea and 2) define the resources we have or those we lack for the feasibility of the Sea Grant pattern in Gulf.

10:50a.m. – 11:10a.m. Break

11:10a.m. – 11:40a.m. Presentations of group work

11:40a.m. – 12:10p.m. Critical topics in productive activities and in the conservation and handling of the Gulf of Fonseca Biodiversity - Edas Muñoz, Technical Adviser of PROARCA. Presentation twenty minutes, dialogue ten minutes.

12:20p.m. – 1:15p.m. Second group activity

Topic: Successful and non- successful experiences of cooperation among universities, ministerial entities, NGO's, and managers of projects within the Gulf of Fonseca, with components in education, extension and investigation.

The groups will make a brief list of cooperation projects executed in the last five years or in current execution. Next, they will select a successful case and one that is not successful or of smaller success, and propose explanations of the successes and difficulties, focusing on the institutional aspects of the cooperation.

1:15p.m. – 2:30p.m. Lunch

2:30p.m. – 3:15p.m. Presentations of group work: Dialogue on possible challenges of a Sea Grant model pertaining to inter-institutional coordination in the Gulf.

3:00p.m. – 3:30p.m. Break

3:30p.m. – 5:00p.m. Third group activity

Topic: Identification of the desirable benefits for a ten years Sea Grant model in the Gulf

Presentations of group work: Dialogue on group proposals, and prioritization of the prospective benefits.

5:00p.m. – 5:10p.m. Reflection of the day's activities

5:10p.m. – 5:30p.m. White Water to Blue Water Initiative- David Alarid, Regional Office of the Environment, USAID

Wednesday

8:30a.m. – 8:40a.m. Overview of Tuesday's activities

8:40a.m. – 9:20a.m. How Sea Grant maintains the quality and the neutrality of their work, Structure of Sea Grant - John Jacob. Presentation 25 minutes, dialogue 15 minutes.

9:20a.m. – 10:40a.m. Fourth group activity.

Topic: 1) To identify two or three questions relative to the key structure of a Sea Grant model in the Gulf of Fonseca and to propose several answers 2) To propose concrete mechanisms to assure the neutrality and the work quality of a Sea Grant model in the Gulf

Preparation and presentation of group work, and dialogue on the implications of the group proposals

10:40a.m. – 11:00a.m. Break

11:00a.m. – 12:30p.m. Fifth group activity

Topic: Identifying the next steps to begin the process in the region.

Groups and designated pairs within the groups identified the key steps to begin the process of developing a Sea Grant model. Presentations of group work

12:30p.m. Workshop Closure- Matt Wilburn and Jim Tobey

Annex 2

Gulf of Fonseca Roundtable Participant List

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ANNEX 3

CONFIGURATION OF GROUPS

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Facilitator: Jim

Group 2:

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Marta Zetino
Andrea Borel
Suyapa Treminio
Conrado Gonzalez
Martin Schwartz
Facilitador John Jacob

Group 3:

Arlene de Franco
Enrique Barraza
Barbara Thomas
Mario Contreras
Aldo Guerrero
Jorge Restrepo
Facilitador: Dan Meyer

Group 4.

Margarita Núñez
Osmin Pocasangre
Nestor Windevoxhel
Luis Caballero
Mario Contrera
José Villatoro
Facilitador: Agnes Saborío

Section 4: Regional Partners

**Honduras, El Salvador, Nicaragua and Costa Rica:
January 2003 Meeting Participants**

Name	Organization	Country
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Andrea Borel	US Embassy	Costa Rica
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Enrique J. Lahmann	IICA	Costa Rica
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Juan Calvia Esquivel	IICA	Costa Rica
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Mario Seixas	IICA	Costa Rica
Francois Degonais	IICA	Costa Rica
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Danelle Kosmal	TNC	Costa Rica
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Mark Cuadra	CIPRES	Nicaragua

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Latin America and Caribbean

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Section 5: White Water to Blue Water Outcomes and Fulbright Senior Specialist-Sea Grant Partnership

WW2BW-Sea Grant Update 2004
Fulbright Senior Specialist Information Sheet
Fulbright-Sea Grant Partnership



NOAA
Sea Grant International
Latin America and Caribbean Program



April 2004 Update and Status Report

NOAA Research Office of International Activities (IA), in partnership with the University of Rhode Island Sea Grant Program and the Coastal Resources Center (CRC), has been actively working towards assessing the feasibility of adapting the Sea Grant model of applied research, extension and education to Latin America and the Caribbean. Last month, the White Water to Blue Water (WW2BW) Conference was held in Miami, Florida and brought together more than 600 Caribbean, Latin American and U.S. representatives to learn about existing marine and coastal management efforts in the Wider Caribbean region and develop new innovative partnerships. Sea Grant International program activities support the WW2BW initiative by providing a proven model that allows countries in this region to address watershed and marine ecosystem based resource issues in a long-term, integrated manner. Currently, Latin American partner universities include the University of Central America in Nicaragua, the University of Zamorano (Pan American School of Agriculture) in Honduras, University of El Salvador and ESPOL in Ecuador.

WW2BW Events and Outcomes

WW2BW was an important event for further adapting the Sea Grant model to the needs of our partners in the LAC region. NOAA Research International Activities coordinated four main activities at the weeklong conference and would like to highlight the contributions of Sea Grant Directors Mac Rawson (GA), Jim Cato (FL), Barry Costa-Pierce (RI) and National Review Panel Member Manny Hernandez-Avila (Puerto Rico) as well as John Jacob (Water Quality Specialist, TX SG).

- A **breakout session** was held as part of the Integrated Watershed Management theme entitled “Adapting the NOAA Sea Grant Model of Linked Research, Extension and Education to the Wider Caribbean Region.” IA Director Rene Eppi chaired this session and presentations were given by Barry Costa Pierce and Stephen Olsen (Director, CRC). Extensive feedback was received in the roundtable discussions that were facilitated after the presentations. Interest remains high on the part of Nicaragua, Honduras and El Salvador to adapt the Sea Grant model to their needs and the three universities plan to hold a strategic planning session within the next two months.
- John Jacob and Barry Costa Pierce facilitated a highly informative “**Sea Grant 101**” session as part of the **Institute@WW2BW**. This course explained the basic working components of Sea Grant and presented an interactive skit highlighting the benefits that SG can provide to coastal and marine resource users.
- A “match-making” table was held and attended by more than fifteen individuals representing governments, NGO’s and academic institutions from the LAC region on the **Senior Fulbright Specialists Program**. This program was appealing to many from the region as it is an effective tool to develop partnerships with Sea Grant programs and associated personnel that have completed the process to be included on the Senior Fulbright Specialist Program roster.
- A second “match-making” table was held to discuss the ideas put forward in the **concept paper**: “A Network of Centers for the Governance of Coastal Ecosystems in Latin America and the Caribbean.” This table was well attended by representatives from a diversity of LAC countries. Many were curious about learning more about the benefits that the Sea Grant model can offer to their particular country.

Priority Next Steps:

Planning, Funding and Implementation

Priority focal areas for partnership in Latin America continue to be the countries of Nicaragua, Honduras, El Salvador and Ecuador. The three Central America partners will hold strategic planning sessions during the next two months and a similar process will be underway in Ecuador by mid-summer. A collective goal for the partnership is to obtain short-term and medium-term support to develop the programmatic and advisory structure of the program and to start initial extension activities by the end of 2004.

Sea Grant Latin America Outlook and Timetable (as of April 2004)		
Event/Paper/Report	Description	Projected or completed Date
Central America Country Analyses and Partnership Building	Continue to interact with U.S. Embassy, government ministries, universities and stakeholders to gain feedback regarding the Sea Grant program in Honduras, Nicaragua and El Salvador.	<i>Completed June/July 2003</i>
Ecuador Country Analyses and Partnership Building	Meet with U.S. Embassy, government ministries, universities and a broad range of stakeholders to disseminate information pertaining to the Sea Grant model and gain feedback.	<i>Completed June/August 2003</i>
1 st Background Paper	The Sea Grant Approach to Coastal and Marine Research, Extension, and Education: A Review of International Experience and Opportunities	<i>First Draft completed August 31, 2003</i>
Host-Country Roundtables	Share information with in-country partners and gain feedback on proper University institutions to partner with.	<i>Completed Ecuador: 10/16/03 Central America: 10/21-22/03</i>
Final Ecuador and Honduras Roundtable Reports Due	Final revisions made to the roundtable reports and final documents prepared in Spanish and English	<i>Completed November 21, 2003</i>
Preliminary Proposal Written	A preliminary proposal based upon the two background papers developed.	<i>Completed December 5, 2003</i>
Partners Meeting in Washington D.C.	Partnership meeting between NOAA, Sea Grant, and URI/CRC to be held in D.C.	<i>Held December 8, 2003</i>
2 nd Background Paper	An in-depth look at the social, economic, environmental and political factors affecting the Gulf of Fonseca and coastal Ecuador and the ways in which a Sea Grant program could address these issues.	<i>Completed December 8, 2003</i>
International Meetings on Sea Grant Latin America	Meetings to be held with NOAA International Affairs, State Department, USAID, etc.	<i>Held December 9, 2003</i>
Widely distribute both Background Papers	Disseminate both background papers in Spanish and English to all partners for review and comment.	<i>Ongoing from December 20, 2003</i>
Completion of 10 – 15 page proposal	10 –15 page proposal/executive summary of the background papers and host-country roundtable discussions.	<i>Ongoing refinement from January 31, 2004</i>
Preparation for WW2BW	Prep for WW2BW	<i>Completed January 1 – March 21, 2004</i>
Dissemination of the 10 – 15 page proposal.	Disseminate the 10 – 15 page proposal to key partners and target individuals for WW2BW.	<i>Completed March 15, 2004</i>
White Water to Blue Water Partnership Building Workshop	Highlight existing partnerships and develop new channels of cooperation in accord with regional network goal. Hold breakout session during the Integrated Watershed Management Day, offer Sea Grant 101 course and informally promote the Senior Fulbright Specialist Program/Sea Grant partnership.	<i>Held March 21-26, 2004</i>
Development of a full proposal.	Working with country partners, U.S. partners, and funding organizations to develop a full proposal.	April 1 – September 1, 2004
Begin Implementation.	On the ground implementation of project activities.	Ongoing

NOAA Research International Activities is committed to developing beneficial partnerships with a wide range of governments, resource management agencies, universities, non-governmental organizations and private industries to advance the interests of Sea Grant internationally. IA openly welcomes your feedback, comments and opinions regarding this initiative. Please contact:

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NOAA
Sea Grant International
Latin America and Caribbean Program



NOAA Sea Grant-Senior Fulbright Specialist Partnership Information

NOAA Research Office of International Activities (IA), in conjunction with Sea Grant and the U.S. State Department, is developing a partnership that will serve to link the highly qualified and uniquely skilled members of the Sea Grant Network with the international opportunities available through the Fulbright Senior Specialists Program. The Fulbright Senior Specialists Program, administered by the Council for International Exchange of Scholars (CIES), is a program that foreign academic institutions may wish to utilize. The Fulbright Senior Specialists Program differs from the traditional Fulbright Scholar competition in that CIES creates rosters of specialists in a variety of fields through an open application process. Approved applicants become candidates for the Fulbright Senior Specialists program. As countries request specialists, candidates are matched with the appropriate programs.

What Role Does the Sea Grant International Have?

Informally linking the Sea Grant program and the Fulbright Senior Specialists program provides opportunities to support the WW2BW initiative by providing trained, technical experts and educators from the Sea Grant Network with potential opportunities related to the ecosystem based approach. Interested specialists from the Sea Grant network would be available as part of CIES roster of Fulbright Senior Specialists. Sea Grant could provide technical expertise from among its affiliated individuals and the Senior Specialists Program provides an extremely well-respected institutional affiliation, logistical, and financial support to accommodate their overseas experience with a host-country university that has requested the assistance.

What Types of Skills and Expertise Do Sea Grant Specialists Offer?

Sea Grant personnel are well suited to these oversea positions due to their experience dealing with diverse cultures and interest groups, their focus on community integration and involvement and their technical skills. The Fulbright Senior Specialists program offers Sea Grant personnel a chance to expand their professional experience, reinvigorate their commitment to research and extension through contact with other university faculty, and allow them to return to their Sea Grant positions with an enhanced, global perspective on the implications of their work.

Examples of potential short term Sea Grant work that could be conducted under this framework include technical courses that could cover topic such as: assisting with administrative structuring and strategic planning, developing a peer review process for the institution, or designing an outreach/extension program, among others.

What Are the Time and Resource Demands of the Program?

The Senior Specialists program is designed for career professionals that are interested in short, two to six week assignments. Grants awarded include international economy fare travel and per diem plus a \$200 per day honorarium. Per diem costs, which are in-country costs for lodging, meals & in-country transportation, are covered by the host institution.

How Do You Request the Services of a Senior Fulbright Specialist?

Countries eligible to participate in the program include those where there is a U.S. embassy or a Fulbright Commission. Foreign academic institutions interested in requesting a Fulbright Senior Specialists must make their request through their local Fulbright Commission. If no such commission exists, then interested institutions should submit their request to the Public Affairs Office at the U.S. Embassy. It is important to note that CIES does not receive project requests directly. The Fulbright Office receives requests and reviews them. The local Fulbright office may have specific steps in the review of requests. If the project request is approved, it is then forwarded to CIES for processing.

As CIES receives requests from overseas academic institutions seeking Specialists, CIES will contact those candidates on the Roster with the most relevant professional experience to ascertain their interest and availability for the grant opportunity. CIES will then send the applications of interested candidates to the overseas Fulbright office (either the local Fulbright commission or the U. S. Embassy that approved the request) for final selection. The Fulbright office in that country, in cooperation with the host academic institution will then make the final selection of the grantee.

How Do I Find Out If My Country Has a Fulbright Commission?

The listing below provides general contact and website information for programs involved in the Fulbright Senior Specialists network. In addition, the list provides information on the Fulbright Commissions in the Western Hemisphere as well as Embassy Public Affairs contact information

Council for International Exchange of Scholars (CIES) 3400 International Drive, NW, Suite M-500 Washington, Dc 20008-3097 Telephone: (202) 686-4000 http://www.cies.org	Institute of International Education (IIE) 809 United Nations Plaza New York, NY 10017 Telephone: (212) 883-8200 http://www.iie.org/fulbright
Academic and Professional Programs for the Americas (LASPAU) 25 Mt. Auburn Street Cambridge, MA 02138 Telephone: (617) 495-5255 http://www.laspau.harvard.edu	United States Department of State 301 4 th Street, SW State Annex 44 Washington, DC 20547 http://exchanges.state.gov Educational Partners Program (202) 619-5289 Teacher & Administrator Exchange Program (202) 619-4556

Fulbright Commissions & Foundations in the Western Hemisphere

ARGENTINA Director: Norma González Telephone: 541-14-814-3561 Fax: 541-14-814-1377 www.fulbright.edu.ar	BRAZIL Director: Luiz Loureiro Telephone: 55-61-364-0776 Fax: 55-61-364-0647 www.fulbright.org.br	CANADA Director: Michael Hawes Telephone: 613-237-5366 Fax: 613-237-2029 www.fulbright.ca
CHILE Director: Denise Saint Jean Telephone: 562-334-4368 Fax: 562-232-3173 www.fulbrightchile.cl	COLOMBIA Director: Agustín Lombana Telephone: 571-287-7831 Fax: 571-287-3520 www.fulbright.edu.co	ECUADOR Director: Susana Cabeza de Vaca Telephone: 593-22-222-103 Fax: 593-22-508-149
MEXICO Director: Arturo Borja Telephone: 525-592-2861 Fax: 525-208-8943 www.comexus.org.mx	PERU Director: Henry Harman Telephone: 511-475-3083 Fax: 511-241-5319 www.fulbrightperu.org.pe	URUGUAY Director: Mercedes Jimenez de Arechaga Telephone: 598-2901-4160 Fax: 598-2903-2031 www.fulbright.org.uy

Embassy Public Affairs Sections in the Western Hemisphere

PAS Asunción Telephone:595-21-213-715	PAS Bridgetown Telephone:246-436-4950	PAS Caracas Telephone:582-975-6423	PAS Guatemala Telephone:502-311-7477
PAS Kingston Telephone:876-935-6053	PAS La Paz Telephone:591-2-432-605	PAS Managua Telephone:505-268-3808	PAS Panama Telephone:507-207-7243
PAS Port-au-Prince Telephone:509-222-1504	PAS Port of Spain Telephone:868-633-5379	PAS San Jose Telephone:506-290-0007	PAS Santo Domingo Telephone:809-540-5745
PAS San Salvador Telephone:503-228-3313	PAS Tegucigalpa Telephone:504-236-9320		

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**NOAA
Sea Grant International
Latin America and Caribbean Program**

Expanding Opportunities by Linking Existing Programs: Potential Partnership between Sea Grant and Fulbright

NOAA Research Office of International Activities (IA) in conjunction with Sea Grant and the U.S. State Department is developing a partnership that will serve to link the highly qualified and uniquely skilled members of the Sea Grant Network with the international opportunities available through the Fulbright Senior Specialist Program. The Fulbright Senior Specialist program differs from the traditional Fulbright in that it offers career professionals the chance to take advantage of short term, 2 to 6 week assignments in conjunction with Universities in 140 other countries. Sea Grant personnel are well suited to these overseas positions due to their experience dealing with diverse cultures and interest groups, their focus on community integration and involvement and their technical skills. The Fulbright Senior Specialist program offers Sea Grant personnel a chance to expand their professional experience, reinvigorate their commitment to research and extension through contact with other university faculty, and allow them to return to their Sea Grant positions with an enhanced, global perspective on the implications of their work.

Current efforts to date to facilitate these opportunities and strengthen the partnership between NOAA and the Fulbright program have been correlated with the White Water to Blue Water initiative. WW2BW is a partnership building initiative spearheaded by the State Department and NOAA focused on linking watershed and marine ecosystem based management in the Wider Caribbean Region. Informally linking the Sea Grant program and the Fulbright Senior Specialist program creates opportunities to support this initiative by providing trained, technical experts and educators from the Sea Grant Network with potential opportunities related to the ecosystem based approach: Sea Grant could provide technical expertise from among its over 3000 affiliated individuals and the Senior Specialist Program could provide an extremely well-respected institutional affiliation, logistical, and financial support to accommodate their overseas experience with a host-country university that has requested the assistance.

Plans to solidify this partnership depend on the level of interest expressed by the Sea Grant network and the opportunities available via the Fulbright Senior Specialist Program, but the initial reaction is extremely promising. This partnership has the potential to directly benefit the newly developed programs based on the Sea Grant model that are developing in Korea, Indonesia, and Latin America. Universities in those countries are eligible to contact the U.S. Embassy and place a request for a Senior Fulbright Scholar to support the Sea Grant program there. Examples of potential short term Sea Grant work that could be conducted under this framework include technical courses, assisting with administrative structuring and strategic planning, developing a peer review process for the institution, or designing an outreach/extension program, among others.

Next steps to further develop the NOAA Research International/Sea Grant/Fulbright partnership in support of the WW2BW initiative include: widely publicizing the Senior Specialist program via the Sea Grant list serves and the National Sea Grant Office website, maintaining communication with the Fulbright Program to determine potential placements, and disseminating information to Embassy Public Affairs and Environment Officers as well as foreign partner universities on the products, skills, technical expertise and language abilities inherent in the Sea Grant Network so as to create additional opportunities.

For additional information:

NOAA Research Office of International Activities:

http://www.oarhq.noaa.gov/ia/ia_home.htm

National Sea Grant Office: <http://www.nsgo.seagrant.org/>

Fulbright Senior Specialist Program: <http://www.cies.org/specialists/>

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Section 6: NOAA Research Office of International Activities Contact Information

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